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# USSR Report

ENERGY

No. 140



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## USSR REPORT

## ENERGY

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## NUCLEAR POWER

### KIEV REGIONAL POWER ASSOCIATION BOASTS OF ITS EFFICIENCY

Kiev PRAVDA UKRAINY in Russian 15 Nov 82 p 4

[Article by B. Yavlin (Kiev): "The Pulse of 'Kievenergo'"]

[Text] Anyone who today considers Kievenergo to be a production association just for the capital is seriously mistaken. It serves about 2 million square kilometers of territory--Kiev, Zhitomir, Cherkassy and Chernigov Oblasts. About 10 million people often have no conception of what a role the operation of the 25,000-person collective plays in their lives. Its pulse is heard with precision here at the Central Control Point.

Colored lights, lines, circuits and figures are scattered over the enormous board. The untrained eye that does not discriminate can get lost in this blinking empire.

"Why so? Everything here is clear," says chief controller A. A. Kozlovskiy. "Within our system are 13 grid substations and 12 electric-power stations, including 3 hydroelectric-power stations on the Dnepr, the Chernobyl'skaya Nuclear-Power Station, and TETs's in Kiev, Chernigov, Cherkassy and Belaya Tserkov. Thus you see here--each substation has its place on the board and indicators of its operating regime. How is it right now? Take a look...."

Three are on duty today at the board: senior controller V. Kukharchuk, controller V. Tikhenko and statistician-operator L. Devyatisil'naya. Under their stewardship are control of all the power facilities, stations and substations and analysis of the operation of each collective and the status of the system as a whole. Now and then the telephone rings. The conversation is laconic.

"Chernobyl? The norm."

"Kanev? Also."

"Belaya Tserkov? The norm."

An around-the-clock watch goes on in the name of this word, the "norm." In supplying its region completely, Kievenergo [Kiev Regional Power Association] also produces a flow of electricity to other oblasts of the republic and the country. Plans and commitments are fulfilled steadily, and an inventory of saved fuel has been created, on the basis of which more than 30 million kWh of electricity will be generated on the 60th anniversary of the forming of the USSR.

The capacity of the capital's electric-power system has grown 40-fold in the last quarter of a century. One of the enterprises that can be thanked for this growth is Kiev TETs-5. Old-time residents remember the Dnepr's shore, where the stacks of the heat-and-power central and the city dump now tower. TETs director I. Chulkov, Knight of the Order of Lenin, Distinguished Power Engineer of the republic and Honorary Power Engineer of the country, said that he had been at the station from the beginning, "from the first stake," but then corrected himself: "More correctly, since 3 million cubic meters of trash of all kinds had been sent out of here."

This new Kiev station has given the country's power system--and not just ours--a new direction. For the first time in the world the skeleton of the main building has been made of prefabricated reinforced-concrete constructional structure with external reinforcement made of metal angle pieces. The footings for the turbines and boilers were made in a new way. Almost 50 percent of the reinforced concrete and 1½ thousand tons of metal were saved during the erection of TETs-5, without, at the same time, any detriment to construction deadlines. Beating the deadlines enabled the generation of about a billion kilowatt-hours of electricity. Thus it is not by accident that Kiev's experience later found wide use not only in CEMA countries but also in the FRG, England, Belgium, France and other countries.

TETs-5 has two important titles: "Model Enterprise" and "Collective of Communist Labor." Each year these are confirmed by excellent work. During the last five-year plan the station was the winner in 15 out of 20 quarters of the republic's competition. This is true also of the last four quarters.

"We can also be called, if you will, forgers of personnel," says trade-union committee chairman V. P. Borisenko. "Many of our blue-collar workers, engineers and technicians have been sent, for example, to TETs-6. And they have proved themselves excellently. In the enterprise as a whole, 896 people are participating in the movement for a communist attitude toward labor, and 676 of them are shock workers. The stations' equipment is most modern, and the mechanization and automation levels are very high, but nevertheless, innovators have introduced about 350 suggestions in the last 2 years with an economic benefit of almost 600,000 rubles. And I would like to say one thing about the drive to protect the environment. Rational work methods reduce discharges into the atmosphere to the minimum. Water undergoes such purification that the most fastidious denizens of our fishing grounds--trout, for example--do excellently. The station's workers have made the grounds into a veritable green oasis. Hundreds of trees and thousands of shrubs have been planted on Saturdays and Sundays. There are about 5,000 rose bushes. A delegation of trade-union activists from Czechoslovakia were our guests recently. We handed them beautiful fall bouquets. They were very much surprised that the flowers were ours...."

We walk about the station with Vladimir Pavlovich. He tells about the people who are on duty: shift chief P. F. Gorbache, inspector S. K. Ogurtsov, instrument monitor O. N. Gusak, senior machine operator V. K. Chumachenko, mechanics P. Ya. Ustimets and N. N. Ribalov, and others. The main part of the TETs is the boiler and turbine department. The turbines drone like airplanes, and the department has been crammed with automation and remote control, it seems, to the limit. At the information center the computer records each of the indicators with precision to the tenth of a second. "Almost half of our workers have a higher education," says electronic engineer A. S. Chuvatin, "so there are no special problems with mastering new equipment."

TETs-5 produces heat for almost half of the capital. The fall and winter period is the most strenuous for the energy producers. The collective was the first in Kiev-energo to receive the certificate of readiness for winter operation. Introduction here of the experience of the Muscovites, with whom the Kievites have been competing now for many years, helped in this success. It is also helping many other collectives to labor steadily and creatively. Experience is being exchanged on a broad range of production problems. The traditional collaboration of the Middle Dnepr and Daugavskaya GES's and of Kiev, Polish, Chernigov and Czechoslovak power engineers is producing real gains in millions of above-plan kilowatts.

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## NUCLEAR POWER

### PROGRESS IN BUILDING SOUTH UKRAINE NUCLEAR POWER PLANT DETAILED

Moscow IZVESTIYA in Russian 27 Dec 82 p 1

[Article by F. Chernetskiy (Konstantinovka Settlement, Nikolayevskaya Oblast): "The Giant on the Southern Bug"]

[Text] You sense the approach to the Yuzhno-Ukrainskaya AES ahead of time: all the new power-transmission lines stand out against the horizon, and the open-work supports pace the steppe as if rushing toward a single point.

Seven years have passed since those who drove the first stakes came here. Seven years of strenuous work of a collective of many thousands. And now, finally, the long-awaited, noteworthy event, which the netted sign, which stretches the whole length of the big building, proclaims: "The first power unit of the Yuzhno-Ukrainskaya AES is our gift to the 60th anniversary of the forming of the USSR."

Aleksandrovka village is not far from the nuclear power station. At one time--in the mid-1920's--it enjoyed great fame. Not just locally but throughout the whole country. A Ukrainian "Volkhovstroy" was born here. A hydroelectric-power station was erected on the Southern Bug River. It was built in accordance with the GOELRO [State Commission for the Electrification of Russia] plan and was second after the Volkhovskaya GES, which was famous in those times.

The nearness of the Aleksandrovskaya GES and the Yuzhno-Ukrainskaya AES enables a sort of little bridge to be thrown up from the not-so-distant past to the present. One can present graphically and recognize the great achievements of the Country of the Soviets over a short historical period. Let's compare two figures: 3,000 and 1 million. The first, so modest, represents the capacity of the Ukrainian "Volkhovstroy," the second the capacity of the first unit of the Yuzhno-Ukrainskaya AES. A different time frame, different capabilities, different measures.

Fuel loading is going on at the upper platform of the reactor building, which is located at a height of 38 meters. Cassettes with nuclear fuel are being lowered into the "boiler," the shell of which, incidentally, weighs more than 300 tons. More than 160 of these multimeter cassettes are placed in the "boiler." The fuel contained in them is enough for a whole year.

A peculiarity of the Yuzhno-Ukrainskaya Nuclear Power Station is the fact that the first of the serially built reactors with a capacity of 1 million kilowatts is being introduced. The construction technology for such power-engineering centers is being worked out here. Another peculiarity of the AES is the fact that, having

three reservoirs with a total capacity of more than half a billion cubic meters of water, it will be supplied with two pumped-storage power stations. This means that at night, when electric-power consumption drops sharply and there are surpluses of power, water will be pumped from the river into the reservoirs. In the evening hours, when power consumption reaches a maximum, the water from the reservoirs will be discharged through water turbines. Thus, at the peak load, another 1.8 million kilowatts, which comes from the hydroelectric power stations, will be added to the 4 million kilowatts generated by the reactors.

The power engineers will also help the countryside. The fact is that nuclear power stations yield a large amount of heat that can be used for economic needs. Therefore, it is planned to build the first phase of a hothouse combine here in the near future. The first phase will consist of 12 hectares of greenhouses.

...Startup! In recent months this word has been disseminated most widely at the construction project. A working startup preceded the current ceremonial startup, that is, the reactor was put into operation and a power startup was made when all the units were tested in unison. And only then, at last, comes, so to speak, the startup in practice, the main startup. Current from the Yuzhno-Ukrainskaya AES has poured into the country's power system.

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## NUCLEAR POWER

### SMOLENSK NUCLEAR POWER STATION PUT UNDER LOAD

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 11 Dec 82 p 1

[Article by E. Mokhorov (Desnogorsk, Smolensk Oblast): "The Smolensk Nuclear Power Station Operates"]

[Text] The first power unit of the Smolenskaya Nuclear Electric-Power Station has been put under a load. It comprises two turbines of 500-MW capacity each. After all three phases have been introduced, this AES will be one of the largest electric-power stations in the country.

Not so long ago some foresters and ferryboat operators dwelt in these peaty localities.

I saw today's residents of Smolensk's Meshchera at the panel of a nuclear electric-power station. Clothed in snow-white protective coveralls, they tirelessly watched the screen, which was reminiscent of a black fall sky, with thousands of stars--now scarcely twinkling, now flaring up with unusual brightness.

Aleksandr Popov, deputy shift chief of the Smolenskaya AES, tells you in great detail about the living conditions in the nuclear town in Smolensk land. This year a complex of modern stores has been built, a school has just opened up, and there is a cinema and even a disco bar. The apartment inventory of Desnogorsk was augmented before the new year began by 50,000 square meters of living space.

Aleksandr Popov's neighbor at the panel--Sergey Kolbasa--came to Desnogorsk from Obninsk, near Moscow--the cradle of the peaceful atom. Sergey worked 6 years there, also at the nuclear power station, and he became a shift chief. He received the long-awaited order for an apartment. And then, on hearing about the majestic construction project, he moved to Smolensk with his wife and two daughters, where there was no kindergarten or housing yet. But then it was promising: each working shift is to give the country 8 million kW of electricity. Now there are no days in Sergey's life that he would spend differently.

The physicists and I stand on an armored slab, under whose thickness are concealed more than 1½ thousand uranium bars. Power from the Smolenskaya Nuclear-Power Station has begun to enter the country's Unified Power System.

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## NUCLEAR POWER

### BRIEFS

**LAST KURPSAYSKAYA HYDRAULIC UNIT--**Kirghiz SSR--The fourth and last hydraulic unit of the Kurpsayskaya GES was put under a load during the competition in honor of the 60th anniversary of the USSR. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 82 p 14] 11409

**SMOLENSK NUCLEAR POWER STARTUP--**The first power unit of the Smolenskaya Nuclear Electric-Power Station, with a capacity of 1 million kW, has produced electricity. It was fed into the Unified Power System of the European part of the country. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 51, Dec 82 p 5] 11409

**'ATOMMASH' IMENI BREZHNEV PROGRESS--**Atomash workers have accepted with pride the news that the name Leonid Il'ich Brezhnev has been conferred on the association. They responded to the decision of the November 1982 CPSU Central Committee Plenum with shock work. The task for the first 11 months of the year for commodity-output realization was overfulfilled by 257,000 rubles' worth of work. In 1983 another 39 specific items that will be included in the sets of equipment for AES's will be added to the components produced. The production of this output is being increased 7-fold at the enterprise. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 82 p 14] 11409

**FOURTH MAIN 'ATOMMASH' BUILDING--**The bays of the fourth building, where the cut-out and blanking department and the department for in-building support equipment are being placed, are taking on an increasingly finished appearance. Zavodstroy [Plant Construction Administration] brigades are turning over finished footings and entire sections to Yuzhtekhmontazh [Trust for the Installation of Industrial Equipment in the Southern Economic Region] specialists, to whom the assembly and setting-up of machine tools have been assigned. By the end of December 57,000 square meters of production space will be turned over for the installation of equipment alone. The carpenters' and concreters' brigade of L. Kurakin and N. Tarasov had especially high results. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 82 p 14] 11409

**'ATOMMASH' EQUIPMENT ARRIVAL SHORTCOMINGS--**More than 500 enterprises and organizations are linked up with Atomash by contracts on collaboration. Most of the supporters are carrying out their commitments with precision. Unfortunately, UkSSR Minchermet [Ministry of Ferrous Metallurgy] plants are letting us down. Thus, Volgodonsk workers still have not received from the Donetsk Metallurgical Plant about 300 tons of rolled metal that were needed back in the second and third quarters. And Zaporozhye's Dneprostal erroneously sent to Kazan metal that was intended for



Atomash. While the inquiries are in progress, the output of an important product is being delayed. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 82 p 14] 11409

'ATOMMASH' BUILDERS' TRANSPORT SUPPORT--An automated system for planning hauling and for managing transport has begun to operate in the automotive-transport administration that services Atomash's builders. Now, at the start of a shift, the drivers receive a computer-designed route map that fixes the times of arrival at the concrete-and-mortar plant, loading, hauling and unloading right down to the minute. The automated system will enable maximum mutual coordination and consistency in the work of the concrete-and-mortar complex, transport workers and workers at the construction site to be achieved. Next, Volgodonskenergostroy [Volgodonsk Power-Engineering Construction Trust] is developing still another series of automated systems for control, which will cover the mutual relations of large-panel housing-construction plants and of transport workers and erectors engaged in housing construction, monitoring of execution of the work, and accounting calculations for all types of construction operations. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 82 p 14] 11409

'ATOMMASH' IN-HOUSE ENERGY--Atomash chief power engineer A. Barkhatov answers the report in Issue No 37: Instruments for reporting the consumption of fuel and power resources in product subunits and in energy-intensive equipment were not specified in the plant's design. Additional points for reporting have now been defined for departments and sections. Proposals have been sent to Leningroenergomash [Leningrad State Design Institute for Power-Engineering Machinery] for introduction of the appropriate changes in the design papers. Orders for the delivery of monitoring and measuring instruments have been made up. Recording instruments for heating water, natural gas, and compressed air in Building No 1 are in the starting-up and setting-up phases and will be introduced at the end of the year. The remaining instruments will be introduced as they arrive. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 82 p 14] 11409

BALAKOVSKAYA 'AES' RAIL SIDING--Balakovo (Saratov Oblast)--A noteworthy event occurred on the eve of the 65th anniversary of the Great October during construction of the Balakovskaya Nuclear Electric-Power Station: operating traffic on the new railroad spur that leads to the AES has been opened up. In a ceremonial setting and to the sound of an orchestra, the first train, decorated with red netted signs, came to the railroad yard with the symbolic name, "Atom." Industrial cranes were on five freight flatcars. [M. Ovcharov] [Text] [Moscow IZVESTIYA in Russian 7 Nov 82 p 3] 11409

SMOLENSK NUCLEAR UNIT ACCEPTED--High reliability, safety and economy and convenience in servicing are the main virtues of the first power unit of the Smolenskaya AES. Tests of the nuclear reactor and two turbines have been passed successfully. The state commission has signed the acceptance certificate for steady operation by the first line of nuclear power in Smolensk land. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 26 Dec 82 p 1] 11409

KURSK 'AES' POWER LINE--The 200-km LEP [power transmission line] that connects the Kurskaya AES with a transportation substation has been put under a load. The LEP is the largest in the Central Chernozem Economic Region--it will supply power completely not only for the Oskol electrometallurgical giant but also for enterprises that are nearby: the Lebedin and Stoyla mining and beneficiating combines. A

reliable electric-power supply will enable development of the underground wealth of the Kursk Magnetic Anomaly to be accelerated. [Text] [Moscow PRAVDA in Russian 2 Jan 83 p 1] 11409

IGNALINSKAYA 'AES' STEAM SEPARATORS--Leningrad--The Izhorskiy Plant Association has completed ahead of schedule the manufacture of two steam separators for the first unit of the Ignalinskaya Nuclear Electric-Power Station, which is being built in the Lithuanian SSR. Its capacity will be 1½ million kW. This labor success was achieved during socialist competition that was organized under the Workers' Relay principle, with the involvement therein of the suppliers of outfitting articles. The first to report fulfillment of the order was a section of department No 4. Here is how chief N. Balandin said it: "When the first separator was shipped in the middle of the year, everyone in the section understood that just one does not matter at the installing site of the AES that is under construction. The point was to produce a second and a third, each of which was being manufactured in a different department. And so our brigades under A. Moskvina and V. Savosin decided to call for a competition of the partners. Thus a labor rivalry was engendered which lasted 80 days." Before the end of the year the Izhorsk builders of power-engineering machinery had shipped to the Ignalina nuclear power facility the last separator, which also will become a labor gift for the fraternal Union republic during the 60th anniversary of the forming of the USSR. The manufacture of equipment for the station's second unit is going on full blast in the association's departments. [B. Pleshanov] [Text] [Moscow IZVESTIYA in Russian 29 Oct 82 p 2] 11409

NEW TURBINE-GENERATOR DESIGN--Design developers of Leningrad's Elektrosila Association undertook the preliminary design of a turbine-generator with a capacity of 1½ million kW. The giant machines, as LENTASS reports, are intended for working in tandem with nuclear reactors that are rated at 1½ million kW, the construction of which is being promoted in our country. The first of these nuclear electric-power stations of a new generation--the Ignalinskaya in Lithuania--will be equipped with steam units of 750,000 kW each. It is planned to create later a single unit of this capacity. The policy of raising the unit capacity of electrical machinery was planned by the 26th CPSU Congress. The specialists connect a further increase in the potential of the units used at electric-power stations with the creation of basically new turbogenerators that use the superconductivity effect of metals whose temperatures are close to absolute zero. Liquid helium cooled to -269 degrees will circulate in the rotors of the new machines. [Text] [Leningrad LENINGRADSKAYA PRAVDA in Russian 4 Nov 82 p 1] 11409

MACHINERY FOR ZAPOROZHYE 'AES'--In regard to the report, "The Matter of the Equipment Suppliers" (Issue No 32), and the retort, "An Unsupported 'Denial'" (Issue No 38): The critical remarks made against Minkhimmash [Ministry of Chemical and Petroleum Machine Building] have been examined. I report that Sumy's Nasosenergomash [Association for the Production of Pumps for Power-Engineering Machinery] has discharged its responsibility and shipped two turbine feed pumps to the Zaporozhye AES. The Sumy Association imeni Frunze sent one set of hydraulic parts for circulating pumps in August and in October. Minkhimmash has now coordinated with USSR Minenergo [Ministry of Power and Electrification] an additional amount of equipment that is to be shipped in 1983, in order to complete the outfitting of Unit No 1 of the Zaporozhye AES. [A. Rutskey, first deputy minister of Chemical and Petroleum Machine Building] [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 82 p 14] 11409

UKRAINIAN HIGH-POWERED GENERATOR--Kharkov--The Elektrot'yazhmash Plant has joined the "millioners' club" of nuclear power-engineering machinebuilding. The manufacture of a generator with a capacity of 1 million kW was begun at the start of the year here. The experience of friends in competition from Leningrad's Elektrosila Association, which has already arranged for the output of this product, will help the collective in this great and important work. The Kharkovers visited the city on the Neva and studied the design and technology for manufacturing the machines. The Kharkovers were at one time pioneers in erecting nuclear units of this type but with a capacity of 500,000 kW. Their operation at the Novovoronezhskaya AES enabled important engineering concepts to be developed fundamentally. Unlike its predecessors, the new machine will enable a "millioner" nuclear reactor to operate in a single unit mutually with one generator--instead of the previous two. In this case, the power-engineering equipment will be 350 tons lighter, and it can be installed in a more compact building. In order to master series production of the "millioners" at the enterprise: leading departments were rebuilt and automatic lines of presses and of casting, thermal and metal-cutting installations with electronic control were started up. Prior to the end of the five-year plan Elektrot'yazhmash will send a consignment of such units to the Balakovskaya and Rostovskaya Nuclear Electric-Power Stations, whose erection was specified by 26th CPSU Congress decisions. [TASS] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 4 Jan 83 p 2] 11409

ROSTOVSKAYA 'AES' CONSTRUCTION WASTE--A news item was published under this headline ["Some Save, Others...."] in Issue No 51 of STROITEL'NAYA GAZETA of 28 April of this year, which spoke in particular about cases of wastefulness at Rostovskaya AES facilities. The Rostovskaya AES staff reviewed the article in the presence of representatives of all the subcontracting and general contracting organizations that are engaged in its construction. The facts pointed out in the article were confirmed. The following steps were taken to eliminate the deficiencies. Metal constructional structure intended for installation of the concreting activity for the Rostovskaya AES were transferred to the installing administration of Volgodonskenergostroy [Volgodonsk Trust for the Construction of Power-Engineering Facilities], which sorted them out, put them in order and installed some of them. All newly arriving reinforced-concrete and metal structure is unloaded at the site of the UPTK [Administration for Production-Equipment Outfitting] of the US [Construction Administration] of Atomenergostroy [Trust for the Construction of Nuclear Electric-Power Engineering Facilities], with observance of the rules for storage. Brick is arriving only on pallets at the facilities being built, and they are unloaded only by crane. Brick and building materials are written off strictly in accordance with the norms, and brick rubble is used on the job. [M. Strel'nikov, deputy chief of the Main Administration] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 26 Nov 82 p 2] 11409

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## NON-NUCLEAR POWER

### REDUCTION OF ELECTRIC POWER LOSSES DURING TRANSMISSION

Kiev ENERGETIKA I ELEKTRIFIKATSIYA in Russian No 4, Oct-Dec 82 pp 3-6

/Article by A. V. Gritsenko, deputy minister of the UkSSR Ministry of Power and Electrification: "Reducing Losses of Electricity During Transmission in Electric Power Networks of the UkSSR Minenergo"/

/Text/ When there is a tight fuel and power balance, the expenditure of electricity during its transportation and distribution becomes an important indicator of the operation of this sector. And measures for reducing this expenditure become a matter of importance to the state.

In 1981 the total losses in the electric power networks of the Ukraine amounted to 19.06 billion kW-hours, or approximately one fifth of the losses in networks of the USSR Minenergo /Ministry of Power and Electrification/.

The obvious importance of this problem is determined by the indicator of relative losses (percentage of losses), as the planning indicator of state assignments; this underscores the fact that reducing losses in the networks is among those crucial tasks for raising the efficiency of the electric power industry.

The relatively large amount of losses as compared with foreign indicators is explained by several objective and subjective reasons.

The high and steadily growing extent of the concentration of generating capacities, the great length of the electric power networks, which provide the output of the capacities of the electric power stations, the operating modes as they depend upon the provision of fuel, the inadequate and late developing construction of networks in relation to the growth of transmission capacities, the large flows of reactive capacity and its consumption, and also the operation of the electric power networks in several instances with an overload (1.5 - 2.5 A/mm<sup>2</sup>) create the objective prerequisites for an increase in the relative amounts of losses.



All the more intolerable in these conditions are the subjective factors, which do not promote a reduction in losses or the conservation of power resources. This includes shortcomings in organization work at all levels of managing the problem of losses, in the planning, analysis, monitoring and accounting of an entire range of questions having to do with reducing them, shortcomings in planning and in carrying out organizational and technical measures which reduce the losses that are still occurring in our work.

The UkSSR Minenergo's organizational work is determined at annual republic meetings on losses, annual orders of the ministry regarding the results of the work of the associations, network enterprises and republic inspectorate for power engineering control on reducing the expenditure of electricity for its transport and distribution, through the analysis and attention of PEO /planning and economic department/ managers regarding their work in reducing losses at the commission on losses of the UkSSR Minenergo, which coordinates the activity of the administrations and ministry departments and other organizations regarding these matters.

The UkSSR Minenergo commission on losses, which is headed by a deputy minister, organizes and directs all methodological work on the problem of losses in the ministry and associations. The commission also oversees the development and adoption of various instructional materials and monitors compliance with the directive documents on losses.

Also very important is the fact that the ministry requires that similar work of the commissions be conducted in all links of the power industry, in the power associations, the network and inspectorate sub-elements.

An important aspect of the ministry's work and that of all of its sub-elements is solving technical problems on reducing the transmission expenditure of electricity. This is work on estimates and optimizing the modes with a minimum of losses, voltage levels, the balance of reactive capacity, the development and adoption of organizational and technical measures, which are aimed at reducing losses, the adoption of new kinds of equipment and methods for maintaining it (super high voltage power lines, transverse monitored transformers, electronic gear for making estimates, operating without disconnecting voltage from the power lines at working potential, the adoption of chromatography and infrared equipment, etc.), the rational distribution of capital investments for network construction, and the adoption of compensation devices (KU) and others.

All of this is resulting in positive results. The 1981 plan for losses was fulfilled by the ministry on the whole and by all power associations. They reduced losses as compared with 1980. This includes Donbassenergo, Krymenergo, L'vovenergo, Odessaenergo. A savings of electricity was achieved as compared with the plan for losses amounting to 50 million kW-hours, including L'vovenergo - 26 million, Khar'kov-energo - 10.6 million, and Vinnitsaenergo - 5 million kW-hours.

A reduction of the expenditure of electricity for transmission can be achieved by the associations fulfilling their organizational and technical measures. The economic savings from this reached 383 million kW-hours, or 110 percent of the plan assignment, in 1981; organizational measures accounted for 210 million kW-hours in savings and the technical measures accounted for the remaining 172 million kW-hours.

The fulfillment of measures for subdividing 226 and reducing to the optimal length of 253 6-10 kV power lines played an important role in achieving these savings. Also contributing to the overall savings were the substitution of 69 overloaded transformers in 35-110 kV networks and 2,340 transformers in 6-10 kV networks, including 280 Mvar static condensers in the networks of the unified power grids and 463.3 Mvar in consumer networks, and a significant reduction in the unaccounted consumption of electricity.

In 1982 in the first six months the losses plan overall for the UkSSR Minenergo was fulfilled, realizing a savings of 18.5 million kW-hours. In the first quarter Donbassenergo and Odessaenergo failed to meet their losses plan goal; they permitted an overexpenditure of 89.6 and 35 million kW-hours respectively. This was possible because the management of the PEO is not doing a satisfactory job of managing the subordinate enterprises on questions of selling the electricity that is produced, does not instruct and ask all managers at all levels to fulfill their losses plans as they should. Similar shortcomings exist in other associations as well, as was carefully discussed at a meeting on losses at the Slavyanskaya GRES. And while Odessaenergo compensated for the overexpenditure in the second quarter by conserving for the first six months some .23 million kW-hours, the Donbassenergo during the first six months overexpended some 39.5 million kW-hours of electricity in losses.

In some cases there are digressions from the requirements of the administrative documents of the ministry on the adoption of the primary estimate of the generation and sales of electric power; as a result the sequence of document formulation on the receipt and sales is disrupted. In addition one encounters elements of utilization when compiling an accounting of unreliable information. Not all PES directors and RES chiefs work on the problem of reducing losses; in several instances they regard this work as a function of the inspectorate organization and the sales department. It is necessary to arrange things so that the RES chief and the PES director understand that they and their subelements are linked together in the production and distribution chain and must together with their subelements and the inspectorates bear full responsibility for delivering electricity to the consumer with minimum losses and at the required quality.

The mechanism for planning losses for the enterprises and RES is not clearly established in all associations and enterprises. For example within Donbassenergo for the PES and RES a percentage of losses is assigned according to the achieved level without taking into consideration the size and structure of consumption. In several associations

and enterprises the size of losses is not coordinated with the planned savings from the adoption of organizational and technical measures. This division of plans is faulty and intolerable.

Starting this year it is necessary for each PEO to develop and adopt a unified instruction on the planning of losses for the PES and RES, which takes into consideration the change in the level and structure of electric power consumption, as well as the adoption of measures on reducing losses, to adjust and complete work on longterm losses plans and measures which ensure their fulfillment.

This fully relates to the subelements of the inspectorate organizations, which in several instances are engaged in sales work to an insufficient extent and are giving preference to inspection work, which also leaves much to be desired. The installation, replacement and operation of devices, estimate, correct formulation of all documentation on the electricity that is produced by stations and electric power networks, the analysis of the change in the structure of consumption and losses still have not become a main concern of the managers of the power inspectorate subelements in their work on conserving fuel and power resources and reducing losses.

This is all the more intolerable when working with the power inspectorate subelements in conditions of a new organizational structure, as seen in the Odessaenergo PEO, where unfinished work is being permitted in addressing several questions. Raids to discover instances of unaccounted consumption of electricity are held infrequently and without bringing in an adequate number of power network workers; a monitoring system to oversee the compliance with the instructions of the power inspection teams has not been organized; and counting errors are permitted in presenting requirements to consumers regarding the installation of KU and others.

Consequently the inspectorate subelements are not doing enough organizational work in ensuring the full sales of the electricity that is released into the network, in improving the quality of the sales and inspectorate work, which does not promote the financial security of the sector or the conservation of energy resources.

It is apparent that to improve the status of sales work it is necessary within the links of the PES and RES to introduce the operational subordination of the chiefs of the power inspectorate division and section on questions having to do with the sales and losses to the directors of the PES and RES, which will be fully responsible for fulfilling the losses plan within their subelements.

In addition in each power association it is necessary to develop and sanction a diagram for organizing the work, interrelationships and responsibilities at all levels and executives from top to bottom for ensuring fulfillment of the losses plan and reducing losses, and for a reliable accounting of them.

In connection with the work on conserving fuel and energy resources, the planned assignments on losses within the networks will continue to be taut in the future. This in turn makes the planning of losses and the measures for reducing the losses inseparable.

The temporary instruction of the USSR Minenergo is an important document for the systematic work in planning and monitoring the measures which reduce losses. In some places this instruction still has not been widely adopted into practice. In several instances within the network subelements approximately 20-25 percent of the trends for planning and adoption of measures for reducing losses are being put to use. Within the power inspectorate subelements this instruction is being put to much less use.

It is necessary to ensure the comprehensive adoption and full utilization of the proposals for the planning and monitoring of measures for reducing losses.

The most efficient measures which have a substantial effect upon the economicalness of power transmission to consumers is network construction, bringing the sources of high voltage energy closer to the consumers and raising the levels of compensation of reactive capacity, i.e., reducing the reactive load within the networks. This latter point is also important as a factor in regulating the voltage level in the control junctions of the power systems, in which the shortage of reactive capacity results in a drop in voltage. Such junctions exist in all power associations.

When network construction lags behind, the problem of compensating for reactive capacity for the consumers and within the junctions of the power systems becomes even more important since the degree of compensation for the Minenergo amounts to .374 altogether; and in several systems this figure is even lower. In the Vinnitsaenergo PEO this figure is .344; Kievenergo - .328. For this reason the problem means that even more consumers need to be involved in the KU work. There is good reason to require 70 to 80 percent of all KU in the power systems be in the locations of consumption. On the whole for Minenergo out of all KU only 61 percent are installed by the consumers. In 1981 specific shifts were noted in this work; the consumers introduced 73 percent of KU capacities that were introduced throughout the ministry. Thus, for example, in the Kievenergo and Krymenergo power associations in 1981 consumers introduced less than 50 percent of the KU. At this pace it will be difficult to achieve the optimal compensation level of .6.

On the other hand, the problem of compensating is to improve the balance of reactive capacity within the junctions of the power systems and maintaining the necessary voltage levels within them. There are shortcomings in this matter because in many power systems there are no clear developments for selecting capacity and places for installing the KU. The time has come for the UO Energoset'proyekt /All-Union Order of October Revolution State Design and Scientific Research Institute for Power Systems and Power Networks/ to resolve this matter



for all power systems on a unified methodological basis, as required by USSR Minenergo directives

Not all power systems and network enterprises are doing what they can to complete the introduction of banks of static capacitors (BSK) in power system junctions on a timely basis. For example, in 1981 Donbassenergo and Ljvovenergo failed to introduce a single kvar of BSK, inspite of having them on hand. In several instances the introduction of BSK is held up for several years, as for instance was the case within Khar'kovenergo (BSK at Voronezh substation), Dneproenergo (SK at Melitopol' substation), and Kievenergo (BSK at Priluki and Lelyaki substations). This is absolutely intolerable.

Problems having to do with the organizational and practical sequence in regulating overcurrents in parallel 750-330 kV, 330-110 kV networks are being resolved very slowly. These problems have not been fully solved within the Southern Unified Dispatch Administration, the power systems, and in the administrations for capital construction and operation of electric power networks of the ministry. The solution of this problem is having a noticeable effect upon reducing losses.

Several trends and measures from the temporary instruction are not being fulfilled. This includes replacing overloaded and underloaded transformers (Vinnitsaenergo, Krymenergo), installing RPN and ARN devices, transferring networks to high classes of voltage, and straightening out the accounting of electricity, etc.

Computers are playing an important role in reducing losses. Computers are used to make optimal estimates, for processing and systematizing teleinformation, forecast estimates, record keeping, analysis, and accounting of losses.

For this reason the UkSSR Minenergo's Main Information and Computer Center and the power systems must develop long-range measures for solving these problems and to optimize the introduction of computer technology both within the power systems and the lower levels of the PES and RES. They must also make extensive use of the experience of the Kiev city networks, the Kremenetskaya RES and others in these problems.

The task of the ministry apparatus, the power systems, network and inspectorate subelements is to ensure that the required organizational and practical work is done to come up with a losses plan.

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NON-NUCLEAR POWER

SYNOPSIS OF ARTICLES IN 'POWER AND ELECTRIFICATION', OCTOBER 1982

Kiev ENERGETIKA I ELEKTRIFIKATSIYA in Russian No 4, Oct-Dec 1982

UDC 621.311.22

EVALUATION OF REMAINING RESOURCE OF HEATING SURFACE OF STEAM GENERATORS

/Synopsis of an article by A.S. Rossovskiy and V.G. Ushakov, pp 7-9/

/Text/ This article examines questions having to do with evaluating the remaining resource of the pipes in the heating surface of steam generators at a TES according to the criterion of extended stability. The article contains formulas and a nomogram for estimating the remaining resource depending upon the value of the temperature rundown. The article also provides a physical interpretation of the results from the estimates.

UDC 697.32:697.382.002.72

EXPERIENCE IN INTRODUCING AIR PREHEATERS WITH GLASS PIPES ON BOILER UNITS AT THE DOBROTVORSKAYA GRES

/Synopsis of an article by B.A. Permyakov, P. N. Korolevich, A. B. Korniyakov, pp 13-16/

/Text/ This article outlines the generalized experience gained in operating glass air preheaters (SVP) with the boilers that are in operation burning high-sulfur coal from the L'vovsko-Volynskoye deposit. The article contains a brief description of the SVP design and cites data on the operating measurements of the basic work parameters.

UDC 621.311.11

WORK ORGANIZATION FOR THE COMPREHENSIVE MANAGEMENT OF POWER EQUIPMENT  
RELIABILITY

/Synopsis of an article by G. V. Mukhopad, pp 16-19/

/Text/ This article describes a logical algorithm for solving the problem of managing the reliability of equipment in the power industry. It takes a look at the stages of work in realizing a comprehensive program of managing power equipment reliability, taking into consideration the specifics of the sector. It demonstrates the need to improve management at all hierarchical levels as regards solving the problem of managing power equipment reliability. It outlines the essential parameters of the program for estimating the indicator of power unit reliability as one of the components of a set of undertakings to analyze and quantitatively evaluate the level of reliability of the power units. This program was developed and adopted within the UkSSR Minenergo.

UDC 621.31

SOFTWARE DATA BASE FOR ASU TP

/Synopsis of an article by O.A. Brenman, B. N. Zolotavin, M.V. Zayats, and S.A. Yakovlev, pp 34-35/

/Text/ This article provides a description of the data base of the ASU TP /automated control system TP/ at the Western Ukrainian 750 kV substation. To speed up the time periods for developing the software of the ASU TP of power facilities, to raise its efficiency and reliability and the possibility of using programs for designing the software for single-type facilities it is proposed that the data base be used as a center of software.

UDC 621.311.052.63

REMOTE CONTROL DEVICE WITH APERTURE CONTROL OF CONFIDENCE IN INFORMATION

/Synopsis of an article by G. A. Mayboroda, pp 37-40/

/Text/ This article provides a description of the working principle of a device with an aperture control of confidence in information for the ASU of power systems; the article also offers an analysis of its efficiency when transmitting information within the power systems.

## BUILDING A MODEL OF THE POLLUTION OF THE ATMOSPHERE

/Synopsis of an article by V.M. Sineglazov, A. P. Kots, pp 42-43/

/Text/ This article offers an approach to creating a model of the process by which pollutants are spread. This approach differs from existing methodologies of modeling, which are constructed upon diffusion equations and the theory of migration, in that it allows for the use small computers (mini or micro computers). This in turn provides for greater efficiency and economy in research.

UDC 614.7

## INTERACTIVE MACHINE GRAPHICS IN AUTOMATED CONTROL SYSTEMS OF AIR POLLUTION

/Synopsis of an article by Ye. V. Pigurnov, pp 43-46/

/Text/ Systems for monitoring air pollution have a connection with regionally distributed data, which change over time. The most efficient form for presenting this data for analysis is graphic, which makes it possible to depict the characteristics of the process in a generalized form. This article examines the dialogue system of machine graphics. It describes the structure of the system, the organization of the interaction with the user and the function, the main function of which is the visualization of the spatial structure of the field of air pollution using a thematic mapping.

UDC 53.08.532.57

## MEASURING THE THICKNESS OF WATER FILM USING THE NONCONTACT METHOD

/Synopsis of an article by B.N. Zharik, V.S. Mil'nichuk, L.P. Makavetskiy, pp 51-52/

/Text/ This article examines questions having to do with the noncontact measurement of the thickness of water film. It justifies the use for these purposes of capacity gauges and describes a device that depends upon the frequency of the measuring generator upon the electrical parameters of the gauge. To determine the deviation in frequency of measuring generator use is made of the beat method. An instrument with such a gauge has a sensitivity of 10 mV when the film thickness is changed by .08 mm. The instrument can be used when studying thermal processes, which pass in a thin film of liquid.

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## PIPELINE CONSTRUCTION

### HIGH OFFICIALS RESPOND TO ARTICLE ON OIL, GAS INDUSTRY PLANNING

Moscow KHOZYAYSTVO I PRAVO in Russian No 11, Nov 82 pp 91-94

[Responses by officials of USSR Gosplan, Ministry of Construction of Petroleum and Gas Industry Enterprises, Ministry of Petroleum Industry and Ministry of Gas Industry to previous article with same headline: "The Pipeline Goes West"]

[Text] It has been 2 years now that the journals KHOZYAYSTVO I PRAVO [The Economy and the Law], PLANOVVOYE KHOZYAYSTVO [The Planning Activity], MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE [The Supplying of Materials and Equipment] and SOTSIALISTICHESKIY TRUD [Socialist Labor] have been publishing in their pages information prepared jointly by traveling editorial boards, which tells about the construction of arterial oil and gas pipelines and poses urgent questions about further development of the West Siberian oil and gas complex.

The purpose of these articles was to intensify the attention of planning organs, ministries and agencies to the assimilation of West Siberia's natural resources and to increase the yield effectiveness of the capital investment directed toward development of the country's fuel and power base. It was this which Comrade L. I. Brezhnev, General Secretary of our party's Central Committee, had in mind when, in addressing the 26th CPSU Congress, he said: "The recovery of oil and gas in West Siberia and the transportation thereof to the European part of the country are to be made the most important elements of the energy program of the 11th and, yes, even the 12th Five-Year Plans."

These plans are being implemented. The magnitude of scale of the gas pipelines that are being erected, for example, testify eloquently to the fact that capital investment on their construction during the current five-year plan alone will exceed the expenditures for erecting the BAM [Baykal-Amur Mainline], KamAZ [Kama Motor-Vehicle Plant], the Volga Motor-Vehicle Plant and Atommash combined.

Not one country in the world has known such a scale of operations up to this time. Our state is the only one where such facilities are being created. For example, in the USA erection of the Transalaska Gas Pipeline took a whole decade, while we have been putting into operation one such gas pipeline each year. It is within the capabilities only of our country to master such an amount of construction.

Sixty-five years ago the Great October Socialist Revolution created a new state--a state of the working people, it brought into life the economics of a society of socialist structure with unprecedented productive forces. At that time, we began everything, it can be said, from zero. But right now our country is recovering



more than 600 million tons of petroleum (including gas condensate) and 435 billion cubic meters of gas each year. For the current year of the 11th Five-Year Plan we have set the task of recovering 645 million tons of petroleum (including gas condensate) and 640 billion cubic meters of gas.

"I love the vastness of our plans, the wide span of the stride," the poet wrote. Yes, the stride of our economy is wide. Yes, we are the first to assimilate the earth's riches on such an unprecedented scale. It is both complicated and difficult for anyone who moves ahead. But it is these difficulties and complexities that are inevitable in such a headlong movement.

When performing construction on such a scale, a search for more effective ways for recovering, refining and transporting raw material for power engineering is necessary. Both miscalculations and difficulties are inevitable. But these are basically the miscalculations and difficulties of growth in the mastery of natural resources on an unprecedented scale. However, they can be made fewer, as testified to by the below-cited answers to the article, "Truboprovod idet na Zapad" [The Pipeline Goes West], which was printed in issue No 6 of our journal this year. In publishing them, we examine the work that has been done, as one of the stages of the joint activity of the editorial boards of the four journals, in publicizing urgent questions of the shaping of the West Siberian oil and gas complex, and we shall continue to help its development in every possible way, raising the most urgent questions of mastering this region's natural wealth in our journal's pages.

We get answers:

USSR Gosplan (V. Negrutsa, chief of the Department for Regional Planning and Deployment of Productive Forces)

USSR Gosplan's Regional Planning Department has familiarized itself with the article, "The Pipeline Goes West," which cited the opinions of Tyumenskaya Oblast organization supervisors on urgent questions of building oil and gas trunk pipelines in West Siberia. The scale of the work that is being promoted to conquer the oil and gas resources there, its importance in the solution of the country's fuel and power problems, the inevitable difficulties in the pioneering conquest of a territory that is so vast and complicated in nature--all these factors exacerbate the many aspects of construction that are associated with planning and management.

The article examined raised urgent questions that touch on the need to overcome a lack of bureaucratic coordination during the forming of West Siberia's interindustry oil and gas complex and coordination thereof with the regional production complex (TPK).

USSR Gosplan is devoting special attention to these questions. In developing the five-year plan for the economic and social development of the USSR during 1981-1985, tasks were established for developing the West Siberian oil and gas complex, and the basic indicators for the economic and social development of the West Siberian TPK were defined. These planning documents established tasks for all ministries and agencies for developing the activity subordinate to them in not only the oil and gas complex but also the regional production complex of West Siberia.

The realization of the tasks given the ministries and agencies in the annual plans that were confirmed by the 11th Five-Year Plan remains an extremely urgent problem.

In this connection, the Standard Practices Instructions on the Procedure for Planning the Development of the West Siberian Oil and Gas Complex were refined this year. They were reviewed by the USSR Gosplan Board and confirmed by a special USSR Gosplan decree of 9 July 1982. At the same time, all ministries and agencies were ordered to specify, when developing the draft plan for 1983, the basic indicators for the economic and social development of the West Siberian TPK. This work is now being completed. In so doing, the proposals of local planning organs are being considered.

A programed study of problems of the economic and social development of this region over the long term are also of special importance. USSR Gosplan has approved, among the most important integrated programs subject to development in the next 2 years, a special-purpose integrated program for developing the West Siberian oil and gas complex and for forming, on the basis of it, a regional production complex during the period up to 1990 and, in the long term, up to the year 2000. Many scientific-research and design organizations have been involved in developing it.

Ministry of Construction of Petroleum and Gas Industry Enterprises (Yu. Batalin, First Deputy Minister)

The information in "The Pipeline Goes West" has been reviewed.

A standing commission for ongoing monitoring of the use and storage of pipe has been established. The ministry's board has generalized, in accordance with the commission's information, the results of the execution by subordinate organizations of the measures that have been approved: on 1 July 1982, reserves of large-diameter pipe had been cut versus the established standard by 140,000 tons; during 1981 and since January 1982, 166 kilometers of pipe have been removed from flooded zones, 158 kilometers have been gathered along the pipeline routes, 390 kilometers have been shipped to other facilities, 47 kilometers have been transferred to clients, and 375 kilometers of pipe are being used for the construction of reserve pipeline strands.

A number of other measures aimed at improving pipe utilization are being taken. In particular, the ministry's board and the industry's trade-union central committee have adopted the decision, "On Additional Measures to Provide Material Incentives to Construction and Installing Organization Workers for the Economical Expenditure of Pipe and Materials and for the Timely Removal Thereof from Facilities Whose Construction Has Been Completed." In effect in the industry are, "Instructions on the Technology and Organization for Hauling, Loading, Unloading and Storing Large-Diameter Pipe During the Construction of Oil and Gas Pipelines," which was approved, with changes that have been introduced.

At the same time, some questions which are outside the jurisdiction of Minneftegazstroy remain unresolved. Despite the fact that Minneftegazstroy has called the deficiencies and oversights that exist to the attention of supervisors of the appropriate ministries and agencies, they continue to include in its plan, as they did before, the construction of pipelines that have not been provided with design and budget-estimating documentation on 1 July. Doing so leads to additional haulage and the formation of excessive reserves of pipe on some line segments.

Minmorflot [Ministry of Maritime Fleet] and MPS [Ministry of Railways] have not taken the measures necessary to protect the insulation of pipe while it is being transported, as a result of which some consignments of pipe arrive at the project

badly damaged (30-50 percent). Also, turnover of the railroad to Urengoy for operation is being delayed, and this greatly complicates the shipment of pipe located at the Kogalymskaya and the Khanymey Railroad Yards.

Simultaneously, Minneftegazstroy has taken steps to further strengthen the juridical services at subordinate enterprises and organizations in order to increase the effectiveness of its activity. Thus, it is proposed to conduct in Tyumen, jointly with the USSR Ministry of Justice, a conference of supervisors of organizations that are located in the West Siberian Regional Production Complex on questions of concluding and implementing capital construction contracts and other economic agreements, the use of punitive sanctions against careless contractors and use of legal means to drive against misappropriation, damage and shortages of state property, and irrational use of material resources. In connection with preparation for this conference, checks were made on the status of the work by territorial main administrations and associations on the questions named above.

Manpower standards for the juridical services are of great importance for manning construction and installing subunits and the subunits that service them with jurists. However, USSR Goskomtrud [State Committee for Labor and Social Problems] and USSR Gosstroy still have not worked out such standards for construction. The currently effective USSR Gosstroy recommendations on standard structures and staffs for the control apparatus of construction organizations do not call for the position of juridical consultants in construction and installing administrations and UPTK's [Production Operations Outfitting Administrations]. This does not meet the rising demands for legal support for the activity of all elements of construction operations.

Ministry of Petroleum Industry (P. Alekseyev, member of the Board)

Minnefteprom [Ministry of Petroleum Industry] has familiarized itself with the questions raised in the article, "The Pipeline Goes West," and considers the majority of them to be indisputably urgent and to require mandatory solution. Minnefteprom reports its opinion on certain of them:

1. On the establishment of a single client for the development of Surgut.

In considering the multi-industry composition of the personnel that make up the city and the large manpower of the developers, and with a view to allowing oilfield workers, builders, geologists, power-engineering workers, and workers of other branches to carry out the tasks that the state has assigned them, and in order to conduct a unified policy for the integrated development of Surgut, we consider it necessary to transfer the function of the single client for the design and construction of apartment houses and of facilities for cultural and domestic-amenity purposes and municipal services, in accordance with its mission, to the Surgut city ispolkom.

2. On the economical and rational use of material resources, particularly pipe.

We consider the suggestion to include a representative of the main regional administration of USSR Gosstnab in the state acceptance commission to be correct. This will help to avoid needless losses of pipe and other materials after conclusion of the construction of facilities. USSR Gosstroy can implement this suggestion, a supplement to USSR Council of Ministers Decree No 105, dated 23 January 1981, "On



the Acceptance for Operation of Facilities Whose Construction Has Been Completed," having been prepared.

In order to erect more successfully pipeline transport facilities for Minnefteprom [Ministry of Petroleum Industry] and Mingazprom [Ministry of Gas Industry] throughout the West Siberian complex, we consider it desirable to create in Tyumenskaya Oblast a specialized centralized USSR Gosstnab base for protecting the pipe reserve and screening it for the most needed types of pipe in amounts that take account of current and long-term (for 2-3 years) construction, to systematically replenish the pipe reserve as it is expended, and to create two or three branches of this base, which will be located in places closest to the northern regions that are promising for construction.

In our view, the creation of such a base would help to raise the quality of the pipe manufactured, since skilled screening of the pipe at the base and the possibility of using punitive sanctions against shippers of defective output would bring output quality closer to the requirements of the state standards.

3. For purposes of the economical consumption of pipe, Giprovostokneft' [State Research and Design Institute for the Oil-Recovery Industry of Eastern USSR Regions] of Minnefteprom, with TsNIIproyektstal'konstruktsiya [State Institute for the Design, Research and Testing of Steel Constructional Structure and Bridges] participation, has developed, "Recommendations on the Selection of Electrically Welded Steel Pipe for Off-Site Oilfield-Facility Pipelines...." They regulate the most used varieties of pipe, the grades of steel and the strength class, and they point out the optimal wall thickness for steel pipe recommended for use in design and construction.

Ministry of Gas Industry (V. Chernomyrdin, Deputy Minister)

The ministry considers that the journal has, in timely fashion, raised questions of the further improvement of the planning and management of pipeline construction, the supplying of materials and equipment, and the standards base for the legal regulation of economic relationships among organizations that participate in the creation of the West Siberian oil and gas complex.

During the year that has elapsed since the Tyumen "round table" was held, the ministry has done definite work to strengthen interagency cooperation and to regularize the legal system in ways that consider the various elements of the functioning of the economic mechanism of enterprises and industries within the framework of the activity of the Interagency Regional Commission on Questions of Developing the West Siberian Oil and Gas Complex under USSR Gosplan.

Thus, USSR Gosstroy has approved standard design solutions for unified integrated-module compressor stations that have different types of units, which Mingazprom and Minneftegazstroy developed with the participation of a number of ministries.

The ministry has also developed, jointly with Minneftegazstroy, and Minkhimmash [Ministry of Chemical and Petroleum Machine Building] has approved a statute on the manufacture and delivery by these ministries' enterprises of integrated-module compressor stations with GTN-25, GTN-16, GPA-Ts-6.3 and GPA-Ts-16 units, which are designed mainly for the Urengoy-Central Economic Region and Urengoy-Uzhgorod systems of gas trunk pipelines, which are under construction.

with a view to accelerating design of the most important facilities, to raising the quality of design and budget-estimating documentation and to intensifying designers' surveillance, groups for integrated design were organized in Urengoy, Astrakhan and Komsomol'sk. TyumenNIIGiprogaz [State Scientific-Research Institute for the Design of Gas-Industry Facilities in Tyumenskaya Oblast] (in Tyumen) and the Saratov Branch of VNIPIgazdobycha [All-Union Scientific-Research and Design Institute for the Gas-Recovery Industry] (in Novosibirsk) are functioning successfully in the West Siberian region.

With a view to further improving the technical-standards base for capital construction of the gas industry and to regularizing the mutual ties with Minneftegazstroy and other ministries and agencies, Mingazprom has prepared for publication, "A Collection of Statutes on Capital Construction." It will enable the branches to solve more responsively and competently all questions that arise during the erection of facilities and, in so doing, will provide for the acceleration of design, construction and introduction of facilities into operation.

In our opinion, similar measures aimed at creating the legal base that regulates the mutual relationships of the ministries and agencies that are participating in development of the West Siberian Regional Production Complex will help to raise the work effectiveness of the Interagency Regional Commission on Questions of Developing the West Siberian Oil and Gas Complex under USSR Gosplan.

The ministry considers it desirable and very useful also to conduct more round-table meetings, with discussion of the most urgent problems of developing the West Siberian region.

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## PIPELINE CONSTRUCTION

### OFFICIALS OF AGENCIES THAT SUPPORT PIPELINE BUILDING ANSWER 'ROUND TABLE' REMARKS

Moscow PLANOVVOYE KHOZYAYSTVO in Russian No 11, Nov 82 pp 125-128

[Article: "After the 'Round Table' Meeting"]

[Text] The intensive path of development of social production presupposes primarily a comprehensive saving of all types of resources. Our movement forward, as was emphasized at the 26th CPSU Congress, will depend in increasingly great measure upon skillful and effective use of the work force, fixed capital, and fuel and power. The information that has been published in the journals PLANOVVOYE KHOZYAYSTVO [The Planning Activity], MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE [The Supplying of Materials and Equipment], KHOZYAYSTVO I PRAVO [The Economy and the Law], and SOTSIALISTICHESKIY TRUD [Socialist Labor] about the rational use of resources for building oil and gas trunk pipelines has been aimed at solving the problems that arise from these tasks.

Replies of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], Minnefteprom [Ministry of Petroleum Industry], Mingazprom [Ministry of Gas Industry] and USSR Gosplan to the information published in these journals have reported on measures that are being taken to eliminate deficiencies in the use of material resources, in the management of trunk pipeline construction and material support thereof, and in the planning and standards that regulate the activity of contracting organizations and clients.<sup>1</sup> New responses to the publication of information about the round-table meeting have arrived at the editorial boards of the journals named.

The scale of operations that are being promoted at West Siberian oil and gas fields, their importance in solving fuel and energy problems, and the difficulties that are inevitable in the pioneering conquest of a territory that is vast and complicated in nature are exacerbating many aspects of planning and management. USSR Gosplan's Department for Regional Planning and the Deployment of Productive Forces is paying special attention to overcoming bureaucratic barriers in forming West Siberia's interindustry complex and in coordinating it with the regional-production complex (TPK). As section chief V. B. Negrutsa reports, during development of the

<sup>1</sup>See, for example, PLANOVVOYE KHOZYAYSTVO [The Planning Activity], Nos 10 and 12, 1981 and Nos 4 and 9, 1982.

five-year plan for the economic and social development of the USSR during 1981-1985, tasks were set for developing the West Siberian Oil and Gas Complex, and the main indicators for the economic and social development of the West Siberian TPK were determined. These planning documents set tasks for all ministries and agencies in regard to developing the activities subordinate to them, not only within the oil and gas complex but also within the West Siberian Regional Production Complex.

Realization of the ministries' and agencies' annual plan tasks remains an extremely urgent problem during the 11th Five-Year Plan. The Standard Practices Instructions on the Procedure for Planning the Development of the West Siberian Oil and Gas Complex were refined this year. They were reviewed by the board and approved by a special USSR Gosplan decree of 9 July 1982. At the same time, the ministries and agencies were given an instruction to specify the main indicators for the economic and social development of the West Siberian TPK when developing drafts of the 1983 plan. This work is now being accomplished, and, in so doing, the proposals of local planning organs are being considered.

The programmed study of questions of the region's economic and social development are of special significance. USSR Gosplan has confirmed that the Special-Purpose Integrated Program for development of the West Siberian Oil and Gas Complex and the forming, on that basis, of the regional production complex during the period up to 1990, and, in the long term, up to the year 2000, are among the most important integrated programs that are subject to development in the next 2 years. Many scientific-research organizations are involved in developing it.

In our interview, "Questions Await Their Solution,"<sup>2</sup> uncertainty was noted about which organizations and enterprises should be included within the West Siberian Oil and Gas Complex. Chief of the Department of Oil and Gas Industry V. Yu. Filanovskiy clarifies this question.

The creation of the Interagency Regional Commission on Questions of the Development of the West Siberian Oil and Gas Complex under USSR Gosplan was the start of a major experiment in forming a system for managing a regional production complex. While the basic components of the economic mechanism have been formulated in various standard enactments for enterprises and branches of the national economy as a whole, such enactments for regional production complexes have just been created. One of them is the document, "Standard Practices on the Procedure for Planning Development of the West Siberian Oil and Gas Complex." It defines the bounds and composition of the complex, its basic tasks and procedures, and a list of the indicators that are included in the drafts of five-year and annual plans for the USSR's economic and social development.

According to the Standard Practices Instructions, the roster of enterprises and organizations and institutes that make up the West Siberian Oil and Gas Complex is determined by those USSR and Union-republic ministries and agencies whose enterprises are doing the work to develop this complex. Such a list, coordinated with USSR Gosplan and USSR Gossnab, will be presented by the ministries and agencies to USSR Gosplan simultaneously with plan drafts.

Enterprises and organizations of MPS [Ministry of Railways], RSFSR Minrechflot [Ministry of the River Fleet], USSR MGA [Ministry of Civil Aviation], USSR Minsvyazi [Ministry of Communications], USSR Gossnab, USSR Goskomnefteprodukty [State Committee for the Supply of Petroleum Products] and of

<sup>2</sup>See PLANOVoye Khozyaystvo, No 5, 1982.



other branches that service the complex, are located within Tyumenskaya, Tomskaya and Novosibirskaya Oblasts and extend appropriate services to the enterprises and organizations that shape the complex, are not part of the complex. However, as called for by the Standard Practices Instructions, they plan their activity for this portion of the various construction projects as, "the West Siberian Oil and Gas Complex," giving USSR Gosplan the plan indicators that characterize the extension of services and making distinctions in the results of all the activity in accordance with existing forms of USSR TsSU [Central Statistical Administration] reporting.

The statute about the regional commission, which was confirmed by USSR Gosplan decree, states:

the commission's work is supervised by the Deputy USSR Gosplan Chairman;

the commission's activity is guided by USSR legislation, decisions of the USSR Government, USSR Gosplan decrees and orders, and the statute on USSR Gosplan; and

the commission operates according to plans approved by USSR Gosplan.

From the moment of creation of the commission, the plans for its work have been approved by the Deputy USSR Gosplan Chairman. The Department of Oil and Gas Industry has been vested only with methodological supervision of the commission's work. This is necessary because the plan drafts that are worked out by the commission are a component part of the plan drafts for developing the country's fuel branch.

The solution of current questions is not included in the regional commission's functions. The plan is the mechanism by which the commission influences ministry and agency regional organizations in solving regional tasks. The preparation of substantiated and coordinated planning decisions, the timely elimination by means of a balanced plan of the disproportions that arise, and the monitoring of plan fulfillment--the tasks for developing the complex that are posed should be solved with the help of these and other control levers.

L. I. Spivakovskiy, temporary Chief of the Administration for the Supply and Rational Use of Ferrous Metals of USSR Gosplan, reported that at one time USSR Gosplan's Board had adopted a decree to guide the procedure for using metal pipe in the construction of oil and gas trunk pipelines. It noted that Minneftegazstroy organizations have large amounts of pipe that is not used for a long time, and pipe is stored at sites for which it is not suitable, in violation of the established rules. Cases of unjustified writeoff and squandering of pipe were pointed out.

The USSR Gosplan Board required Union-republic gosplan and USSR Gosplan main regional administrations on whose lands trunk pipelines are being built to check the status of use and preservation of pipe in Minneftegazstroy, Mingazprom, and Minnefteprom construction organizations and the measures taken by these ministries and to systematically send workers to check in the field on observance of the rules for storage of the pipe and the unloading thereof at the welding-stand points and at the construction sites.

Minneftegazstroy has created a standing commission for current monitoring of the use and storage of pipe. According to the commission's information, the Minneftegazstroy Board has twice examined the preliminary results of fulfillment of the approved measures for improving the use of pipe in subordinate organizations. As a

result of the set of measures that have been adopted, surpluses of large-diameter pipe as of 1 July 1982 proved to be below the standard by 140,000 tons, and the surpluses of pipe in pipelengths have been reduced by 410,000 tons.

The plan of operations for 1982 included facilities at which more than 300 kilometers of pipe had been imported; operations on the construction of 628 kilometers of reserve strand at pipelines put into operation, including the Ust-Salyk-Kurgan and Ufa-Almetyevsk oil pipelines, are also to be completed.

In the interview, "Questions Await Their Solution," there was reference to miscalculations of planning and supply, poor responsibility for the protection of materials, and the fact that USSR Minchermet [Ministry of Ferrous Metallurgy] plants sometimes send pipe to Minneftegazstroy organizations that violates the mix and in quantities that create an excessive reserve. L. I. Slivakovskiy explains the miscalculations in planning by the fact that, at the instance of the client ministries, during the year various facilities are excluded from the plan and others are included, the requirements for pipe is changed accordingly, and the pipe imported earlier is not used.

USSR Gosplan, USSR Gossnab and USSR Minchermet approve the plan for producing welded large-diameter gas-pipeline pipe in sizes and wall thicknesses that are based on the client-ministry data, and in the amounts determined by Minnefteprom and Mingazprom design institutes in accordance with a direct (physical) count. Soyuzglavtrubsnabsbyt [All-Union Main Administration for the Supply and Marketing of Pipe] issues orders for delivering pipe to Minneftegazstroy organizations strictly in accordance with the specifications presented by this ministry, with indication of the destination and the recipients. Economically desirable changes caused by reduction in the length of the route or crossings are often introduced into these designs, leading to the formation of pipe surpluses.

Glavsibtruboprovodstroy [Main Administration for the Construction of Siberian Pipelines] Chief N. I. Kurbatov said that, because of the late arrival of design and budget-estimating documentation, Minneftegazstroy organizations are forced to present orders for pipe prior to receiving these documents, and, naturally, miscalculations are committed in the orders. In the opinion of USSR Gossnab, the designing of trunk pipelines requires that great attention be paid to the deadlines for presenting the design and budget-estimating papers and to the quality of the designs themselves. For this purpose, the matter of departmental subordination of the design institutes should be reexamined. At present they are subordinated to the client ministries, Mingazprom and Minnefteprom, while Minneftegazstroy, the general contractor for building the pipelines, has no influence of any kind on the institutes' work. Minneftegazstroy has repeatedly posed the matter of transferring subordination of the institutes that design gas and oil trunk pipelines to Minneftegazstroy, where questions of design and of refinements thereof during construction would be resolved more responsively and competently. In the opinion of L. I. Slivakovskiy, this proposal deserves attention and its solution will help to eliminate existing deficiencies in the use of the pipe because of untimely development of and later introduction of changes into the design and budget-estimating documentation.

As for proposals about developing the storage activity in the region and improving the system of deliveries; raising responsibility for the rational and economical use of material resources during the construction of oil and gas pipelines in all construction and installing organization elements; coordinating the actions of

clients, contractors, designers, planners and other construction participants; creating economic stipulations under which builders would bear meaningful pecuniary responsibility for pipe damaged through their fault; and about transport organizations' taking responsibility for protecting pipe during transport, unloading and other operations, Minneftegazstroy, together with the interested ministries and agencies, including the Main Regional Administration for Supplying Materials and Equipment of Tyumenskaya Oblast, are to work out and execute a complex of measures for realizing them.

Deputy Minister of Gas Industry V. S. Chernomyrdin reports that, with a view to accelerating design of the most important facilities, raising the quality of design and budget-estimating documentation, and intensifying designers' surveillance, groups for integrated design have been organized in Urengoy, Astrakhan and Komso-mol'sk. The TyumenNIIgiprogaz [State Scientific-Research Institute for the Design of Gas-Industry Facilities in Tyumenskaya Oblast] and the Saratov Branch of VNIPI-gazdobycha [All-Union Scientific-Research and Design Institute for the Gas Recovery Industry] are functioning successfully in the West Siberian region. In order to improve the engineering-standards base for capital construction of the branch and to regularize mutual ties with Minneftegazstroy and other ministries and agencies, Mingazprom has worked out and is readying for issuance, "A Collection of Statutes on Capital Construction." It will help workers to solve questions of design, construction and the introduction of facilities into operation more responsively and competently.

Minnefteprom Board Member P. D. Alekseyev acknowledges that the proposal to include a representative of the USSR Gosstrib Main Regional Administration on the state acceptance commission deserves attention. This will enable unnecessary losses of pipe and other materials to be avoided after the construction of the facilities is completed. USSR Gosstroy can implement this proposal by preparing a supplement to the document that regulates the acceptance for operation of facilities whose construction has been finished.

It is desirable, for purposes of more successful construction of facilities in West Siberia, to create in Tyumenskaya Oblast a specialized centralized USSR Gosstrib base for the storage (and also the screening) of reserves of pipe--for the varieties in greatest demand and in amounts that consider near-term and long-term construction, plus the systematic augmentation of pipe reserves as they are expended. Two or three branches of this base could also be created in localities closer to the northern regions that are promising for construction.

Organization of the base and its branches, to be directly connected with USSR Minchermet enterprises, would prevent or reduce deliveries to construction organizations of pipe that is defective or not of the appropriate design or of pipe in amounts that exceed requirements and would allow pipe to be transported from these bases on more favorable dates, without losses, and by the shortest routes.

In P. D. Alekseyev's opinion, the erection of such a base would help to raise the quality of the pipe manufactured, since skilled screening of the pipe at the base and the possible use of economic penalties where defective pipe is delivered would serve to bring output quality closer to the requirements of the state standards.

For purposes of economical expenditure of pipe, Giprovostokneft' [State Research and Design Institute for the Oil-Recovery Industry of Eastern USSR Regions] of Minnefteprom, together with TsNIIproyektstal'konstruktsiya [State Institute for the

Design, Research and Testing of Steel Constructional Structure and Bridges], have developed, "Recommendations on Choice of Electrically Welded Steel Pipe for Off-site Oil and Gas Oilfield-Facility Pipelines." They regulate the most-used varieties of pipe, the grade of the steel and the strength class, and they indicate the optimal wall thicknesses of the steel pipe that is recommended for use during design and in construction.

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## PIPELINE CONSTRUCTION

### OVERALL PROGRESS ON GAS-EXPORT PIPELINE CONSTRUCTION REVIEWED

Moscow PLANOVoyE KHOZYAYSTVO in Russian No 11, Nov 82 pp 58-61

[Article by V. Yu. Filanovskiy, chief of USSR Gosplan's Oil and Gas Industry Department and Lenin Prize winner: "On the Construction of Trunk Gas Pipelines"]

[Text] The journal's editorial board asked chief of USSR Gosplan's Oil and Gas Industry Department and Lenin Prize winner V. Yu. Filanovskiy to describe progress in and prospects for the construction of gas-industry facilities, including the Urengoy-Pomary-Uzhgorod gas-export pipeline.

The gas industry is the youngest and, at the same time, the most rapidly developing branch of the USSR's fuel and power complex. The Soviet Union is second in the world, after the USA, in gas recovery, but in pace of growth it surpasses all countries of the world. During the last 20 years gas recovery in the USSR rose almost 10-fold, and in 1981 output was 465 billion cubic meters.

Natural gas's share in the country's fuel and power balance is more than 25 percent of the production of primary fuel-and-power resources, and it provides 22 percent of the electricity and 37 percent of the heat energy generated. About 93 percent of the pig iron and just as much of the open-hearth steel, 45 percent of the rolled metal and 60 percent of the cement are now produced with the use of natural gas.

The role of gas as a raw material for producing ammonia, methanol and a number of other chemical products is great.

Natural gas's importance as a raw material for chemicals and as an industrial and power-engineering fuel is increasing continuously. This is explained by the fact that gas's special properties, such as an absence of mechanical losses of fuel, high completeness of combustion, ecological cleanness, and other characteristics provide a greater economic benefit than other types of fuel and raw material, through increased productivity and efficiency of the equipment, a reduction of specific consumption and improvement of output quality.

The Soviet Union has at its disposal the world's largest explored natural-gas reserves, and these are constantly being augmented. During the 10th Five-Year Plan alone the plan for increase in gas reserves was overfulfilled by 1.5 trillion cubic meters.

In recent years a large number of huge gas fields was opened up in Turkmeniya, Kazakhstan and the Lower Volga. Their development will start during the current five-year plan. Thus, in the European part of the country, the Astrakhanskoye gas-condensate deposit, on the basis of which the forming of a large industrial complex has started, has been opened up. Thanks to the gas's unique composition--it contains up to 25 percent hydrogen sulfide and substantial amounts of liquid hydrocarbons, it will be a major source for supplying the national economy not only with gas but also with sulfur, condensate and liquefied gases.

However, the country's main gas-producing region is, and for a long time will be, West Siberia, where a large portion of the discovered gas reserves are located and such fields as Urengoy, Yamburg and Medvezhye--the world's largest--are found. By 1985 gas recovery in this area is to reach 356 billion cubic meters. This is as much as was recovered throughout the whole country just a few years ago.

In the last 10 years the world's largest gas-recovery center has been created in West Siberia, under complicated natural and climatic conditions (swamps and tundra), and the gas-worker cities of Nadym and Novyy Urengoy have been built and continue to grow.

The high pace of growth of gas recovery planned for West Siberia and some other regions brings up the problem of accelerating build-up of the gas fields, which can be solved only on the basis of highly effective advanced equipment and technology. Thus, the new fields will be developed by using cluster drilling of large-diameter wells, which will enable the length of gas-field service and support lines to be reduced by 20 percent. Modularized automated technological lines with a unit productivity of 3-5 million cubic meters per day are being used, enabling construction time to be halved and labor productivity to be increased. The use of high-productivity turbo-expansion engines for gas preparation and cooling is called for. The technology of the controlled development of deposits, employing selective methods for touchdown and new methods for intensifying gas flow, will find wide application.

A most important task for developing the gas industry is the creation of large gas transport systems that link up the gas-recovery regions with the main consuming centers. In addressing the November 1981 CPSU Central Committee Plenum, L. I. Brezhnev noted that, during the 11th Five-Year Plan, the five largest gas trunk pipelines, from West Siberia to the Central Economic Region, and also the Urengoy-Izghorod gas-export pipeline, which are "central construction projects of the five-year plan," are to be built and put into operation.

The USSR has already created a network of gas pipelines which, combined in the Unified Gas Supply System, is the world's largest in capacity and in available pumping power. The total length of just the gas trunk pipelines that make it up today is more than 130,000 kilometers, and the installed capacity of the pumping units on the gas pipelines exceeds 20 million kW.

The creation of the Unified Gas Supply System, which includes underground gas storage as well as gas pipelines, provides for flexible and responsive manipulation of the gas in large streams, increases the reliability of the gas supply for consumers and promotes better use of the gas fields' productivity capacity. This system is now supplying more than 1,900 cities and towns, 2,600 settlements and more than 80,000 rural communities. About 200 million people, that is, almost three-fourths of the country's population, are using gas at home.

In order to support the delivery of large volumes of gas over great distances, gas trunk lines are being built with large-diameter pipe, and the compressor stations are being equipped with high-powered gas-pumping units. It should be noted that our country was the first in world practice to use pipe of 1,020 mm, 1,220-mm and 1,420 mm diameter. The main gas trunk lines are now made of pipe 1,420 mm in diameter which are designed for use at high pressures.

Domestic industry is producing various types of gas-pumping units: with stationary gas-turbine drive of 6,000 to 16,00 kW, based upon aviation turbines of 6,300 and 16,000 kW power, and with electric drive of 12,500 kW capacity. Units of 25,000 kW capacity are being created.

The construction of gas trunk pipelines is assigned to Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises]. During the 10th Five-Year Plan its organizations built 17,700 kilometers of gas trunk lines with 1,420-mm and 1,220-mm diameter pipe, and during the current five-year plan it is planned to introduce 27,400 kilometers of such arterials.

While previously the construction of one large gas pipeline took 2-3 years, by the end of the current five-year plan these periods will be reduced to 1 year. Not one other country in the world has such experience in erecting gas trunk pipelines of such diameter 3,000-4,000 kilometers long. The majestic scale and pace of erection of the gas pipelines have required the development and introduction of fundamentally new technologies for construction work and for organizing it. The pipelines are laid by the flow-line method, and outfitted-module construction is being used widely for erecting compressor stations.

In order to assure fulfillment of the tasks set by the 26th CPSU Congress for developing the gas industry during the 11th Five-Year Plan, it was planned to build five gas trunk pipelines from West Siberia to areas in the country's European portion and to expand the existing Central Asia-Central Economic Region gas-transporting system. However, because of the request of a number of Western countries (the FRG, France, Italy and Austria) to increase gas deliveries to them above that called for in the contracts already concluded, the Soviet Government, showing good will, adopted the decision to build a sixth gas pipeline specially for this purpose. As a result of appropriate negotiations, an agreement was concluded which has received the name "Gas for Pipes" in the press. Under it, the Soviet Union has committed itself to build a gas pipeline from the Urengoy field to the USSR's western border, provided that the Western countries that are interested in obtaining gas will take part in realizing the project by allocating our country credits and delivering pipe and equipment.

Erection of the gas-export pipeline, which will follow the Urengoy-Pomary-Uzhgorod route, is a large-scale project. Its length will total about 4,500 kilometers, 970 kilometers of which will pass through swamps and flooded areas. Twenty-one large rivers, more than 850 small streams and creeks, and 69 railroad and 368 highway crossings are to be surmounted. Forty compressor stations with a total power of 2.8 million kW will be built on the gas pipeline, and throughput will be 32 billion cubic meters of gas per year. Despite this scale, the gas-export pipeline should be built in a very short time, and gas will begin to go over it to Western Europe in 1984.

As is known, conclusion of the agreement to build the indicated gas pipeline, which would promote the development of mutually advantageous trade and regularization of

the international order, caused dissatisfaction of the USA's current administration. It decided to impede this project by prohibiting the delivery to the USSR from the USA of pipelayers and certain gas-pumping unit parts that are produced by American companies or under American licenses. Unprecedented pressure was exerted also on West European firms that make equipment for the gas pipelines with a view to compelling them to refuse to deliver it to the Soviet Union.

There had been previous attempts to exert economic and political pressure on our country, and they always ended up in failure. Back at the start of the 1960's, Washington tried to stop the construction of oil and gas pipelines in the USSR by an embargo on deliveries of pipe from the FRG. But the Soviet Union in a short time created its own high-capacity base for producing large-diameter pipe and has continued to build up the recovery of gas and oil at a rapid rate.

L. I. Brezhnev, in addressing the 17th USSR Trade-Union Congress said: "By the way, about blockades and 'sanctions.' The Soviet Union is a large country, with a powerful economy and rich resources. All the more so together with the socialist comity. So it is that we will somehow survive, and let no one have any doubts about that. But among those countries that Washington calls its allies, many depend much more upon foreign trade for their overall development."<sup>1</sup>

Although the American administration's actions put the West European firms in complicated situations and led to a delay in their shipments of equipment for the gas-export pipeline, the Soviet Union did not change its commitments. Measures were developed and executed for insuring the introduction of the Urengoy-Pomary-Uzhgorod gas trunk pipeline into operation. These included expansion and acceleration of the production of gas-pumping units and of other gas-pipeline equipment, and also of construction equipment, which will enable the gas export pipeline and the other five gas pipelines, which are designed to supply gas for the country's own needs, to be completely outfitted with domestic equipment and their construction to be finished before the deadline. This solution found an enthusiastic response by and the support of all workers. Many enterprises held meetings at which increased commitments were adopted.

The Sterlitamak Plant in Bashkiria organized the production of domestic pipelayers in accordance with its own technical and operating specifications, which outperform the pipelayers that the Americans sent us at one time. Before the end of the five-year plan, 1,700 units will be produced. The Leningrad Production Association "Nevskiy Zavod" imeni V. I. Lenin is organizing the series manufacture of gas-pumping units of 25,000 kW power as quickly as possible.

Construction organizations of Minneftegazstroy and other ministries have promoted work on erecting the gas export pipeline over a broad front. By the start of September this year, 1,866 kilometers of the route had been prepared, beating the schedule for welding more than 670 kilometers of pipe into the strand. All this encourages the assurance that Siberian gas will arrive in Western Europe beginning in 1984. This will be still another confirmation of our government's peace-loving policy, a graphic example of the development of long-term mutually advantageous trade and economic ties in the spirit of the Final Document of the Conference on Security and Collaboration in Europe at Helsinki.

<sup>1</sup>L. I. Brezhnev. "Zabotu o lyudyakh truda, zabotu o proizvodstve--v tsentr vnimaniya profsoyuzov" [Concern About People's Work and About Production are the Trade Unions' Main Concern]. Moscow, Politizdat, 1982, page 12.

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## PIPELINE CONSTRUCTION

### TAJIK GAS PIPELINE TURNED OVER FOR OPERATION

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 26 Dec 82 p 1

[Article by G. Papyrina: "There Is 'Blue' Fuel!"]

[Text] The Beshtentyak-Kulyab gas pipeline has gone into operation!

The Beshtentyak-Kulyab gas pipeline, 50 kilometers long, has come to its "terminal" point--the automated gas-distribution station. There was ceremony here, which was awaited with impatience. When the slide valve was opened, bulldozer operator Vladimir Shul'gin, who had participated in the construction of all the gas pipelines in the republic, lit a torch. The upward busting flame shed heat. People congratulated each other on the labor victory. And everyone mentally looked back to a key point.

These strenuous days will live long in the memory of electric welders A. Polovov and R. Sultangoreyev, insulation brigade leader Sh. Valiyev, pipelayer operators V. Vasil'yev and M. Pokrovskiy and excavator operator B. Moshkovich, who experienced many difficulties, the bitterness of failures and the joy of successes.

The assault began at the Beshtentyak field. Experienced, well-known Tadzhikneft' [Tajik Oil Production Association] specialists were in the construction detachment (let's call it that). The main burden of the operations lay on the collective of Construction and Installing Administration No 1. It was faced with the task of assembling and laying pipe in ditches under difficult mountain conditions, where the altitude gradient reached 1,500 meters, and across the Kulyabdar'ya and Yakhsu Rivers.

The key point of the operations came in the middle of 1981. Building was going on and progress was being made. At the end of August it became clear: there must be a speedup in order to finish on time. And then the staff made a decision to transfer a section of workers and equipment from the north. This was done expeditiously. But now the snow fell and rains became more frequent. The local sites became impassable, and the roads, well beaten and rolled by machinery, were made into a mush.

The people did not give up in the face of the difficulties. Work did not cease at all during daylight hours. Mutual support was strong. If something happened, they did not wait for a repair brigade--they coped with it themselves. People showed



native sharpness and creativity. Chief of Construction and Installing Administration No 1 V. I. Mityukov said that electric welder V. Korniyetskiy offered to build a device for drying the pipe prior to insulating it. Given the high humidity, the offer was very valuable. The device was built in the administration's workshops in accordance with Korniyetskiy's drawings, and pipe insulation proceeded without delay.

The gas-pipeline builders had still another difficult moment when they went through the Markasay Pass. This was the highest point on the route. There were steep drops there, and it was dangerous to use the machinery. The best variant was found with combined efforts: change the pipeline route a tiny bit and attack this section from two sides. So then two brigades did insulating work. The mobile asphalt cookers operated from 0200 hours. Duty personnel remained beside them. By morning everything was ready for continuing the attack on the pass.

Yes, there was a battle for the gas pipeline, over which gas will now flow for the needs of industry and the oblast center, and the apartments of Kulyab residents will be lit up. These circumstances acquire special significance, since there is a great deal of mazut-burning vehicle traffic each day in the oblast. Therefore, introduction of the gas pipeline, it can be said, is a holiday gift for Kulyab residents. What they have been awaiting for a long time has been completed. And it was completed thanks to the Tadzhikneft' collective.

"Oil and gas is not obtained easily," said association general director N. Malikov. "Special emphasis was put on geological-engineering measures, increased well productivity, and the introduction of new technology and advanced experience. And now the results: socialist commitments for recovering gas and selling the output were carried out above the plan. Millions of cubic meters of gas above the plan were obtained. The new customer--Kulyab--can now receive an adequate supply of gas."

The commitments for oil recovery and well penetration were realized successfully. Right now the collective is working on long-term development. For the new year this means new areas, new recovery regions. And although the way to them is difficult, the oilfield workers will know how to develop the new underground storehouses. The advanced collectives of the Nefteabad Drilling Administration, the Nefteabad Oil and Gas Recovery Administration, and the Gissar Drilling Administration, which are engaged in the anniversary competition for prize positions in the country's oil industry, have proved many times that they are excellent in labor.

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## PIPELINE CONSTRUCTION

### VOLGATO SURA PIPE SECTOR COMPLETED

Moscow STROITEL'NAYA GAZETA in Russian 19 Dec 82 p 3

[Monologs by pipeline-route workers recorded and introduced by L. Komarovskiy:  
"The Pipeline-Route Workers"]

[Text] Yesterday, on the Communist free-work Saturday that was dedicated to the 60th anniversary of the USSR, an integrated flow-line group from Kuybyshevtruboprovodstroy [Kuybyshev Pipeline Construction Trust] completed erection of the linear portion of the 127-kilometer Volga-Sura section of the gas-export pipeline. By yesterday, 2,000 kilometers of pipeline had been welded on the whole route.

The old Chuvash town of Tsivil'sk has been finished off with streets of neat houses made of silicate brick. Farther on is a potato field on which tractors smeared with heavy black soil spread fertilizer and ready the ground for the coming spring. Between the last Tsivil'sk street and the first potato field are seven perfectly straight rows of "barrels"--mobile housing, the basic housing for pipeline-route workers. This is the settlement for the builders of the 127-kilometer section of the gas-export pipeline that passes through Chuvashia.

One can study the country's geography by the licenses on the Zhiguli, Moskvich and Volga cars of the residents housed: Kuybyshev, Chuvashia, Ul'yanovsk, Smolensk, Tataria, Moscow Oblast....There are many vehicles, and this is not astonishing--pipeline-route workers live richly, their pay is good. And the fact that they are registered in different parts of the country does not at all mean that the people work here temporarily. There is driver Viktor Yefremov and his wife Valentina, who have been on the pipeline routes for a decade and a half. They remember both the Arctic Urals and the burning Khorezm....

People in the settlement have been building for the long term. Judging by everything, they will live here until the end of the five-year plan. The section of the gas-export pipeline still has not been finished, but already work is in progress on documentation for the next strand. And then there will be other lines in this corridor. That is why they are building and making themselves at home, as if for good. Those who came to the settlement for the first time in May or June are now wintering with their potatoes--they managed to plant and gather a harvest. Others will set up a subsidiary farm in the spring--agreements have been concluded with neighboring kolkhozes about allocating land.

But this is spring....And still the main concern is the route of the export arterial. The flow-line operations group of Kuybyshevtruboprovodstroy has committed

itself to completing its section by the 60th anniversary of the forming of the USSR. And this is not simple. The pipe from the Volga to the Sura crosses highways and railroads in 15 places, 8 small rivers and 60 ravines. In brief, there is not a kilometer without an obstacle.

During my journalist trips I have several times encountered them. My notebook has records of conversations with line workers, their tales about themselves and their work. In rereading these notes, the monologs of workers on the lines, it is as if you are falling again into the atmosphere of the difficult work, where everyone reckons the days by one measure--new kilometers of trunk line. I offer some of these entries to the readers.

Brigade Leader Viktor Tankikh. No, I don't like this weather. Do what you like to me, but I don't like it and that's that. I said last August: "Don't rejoice at the gold on the trees. There in the forest they are drinking deeply, so spring will be delayed!..." It must be second sight--it is December, and we are still in the mud communicating with each other by telepathy. The ground here, you can see for yourself: it is black earth. The least bit of rain and it gets as slippery as soap. You get by, you are on guard, as if expecting a trumpet to sound or something else to happen....For me, 40 degrees below zero is better, like in Igrim, than the local slush....

Don't think we work worse just because of this. We are meeting our commitments, but it is made difficult. For we have an important stimulus: nowadays, for the first time, we are paid for finished gas pipeline. If you weld, backfill and test and restore the fields--you get money. What kind of pay? It has increased. Without any northern increment, we are paid just as much as in the North....

I do not remember Igrim by accident. A majority of the lads in our brigade passed through a good school. We welded pipe in the Arctic Urals, and we also remember the Tyumen lines. I call them "lads" by habit. See for yourself--their ages are from 30 to 40, when a man has strength not just in his arms.

But we don't chase youth away--there is Kolya Lazarev, he lines the joints, he is a young lad, a local, and he has become accustomed to our brigade. We teach him and help him master a specialty. I myself--I began the same way. I came to the line as a driver, and then I was taught to be a truck-crane operator, and now I am in charge of a welding and assembly brigade here. The route itself sends you to the needed spot. If, of course, you want to work and not botch things up.

Settlement Mayor Rimma Korekina. Oh, excuse me, but I have no time. The dispatcher has finally given me a truck, and I will go to Cheboksary to get billiard tables. We managed to get two tables, and you know yourself that they will not keep long in storage. They are wanted more than anything else. Our young ones, as soon as they heard that we are getting these tables threw themselves at once into a discussion about where to put them. The mobile housing or the "barrels" there are not large enough--not enough room to draw back. A billiard house must be built from scratch. Well, now, you can count on it, if there are tables the men will build a billiard-house quickly.

Jokes are jokes, but we do have a problem of free time. We make ourselves at home, it is true, tolerably. We have got table tennis, the club has been finished, and we are expanding the library. Everything, of course, must be done more quickly,

because we have a pace, you know it yourself....This is for the pipeline, but in regard to living conditions, we still cannot keep pace with production.

Of course, we are acquiring sports equipment, the snow falls and we get on skis, we flood the staking rink, and we build a snow city for the children. In the spring we will plant flowers around the "barrels," to add beauty.

And somewhere in the newspaper I have read that living conditions on the pipeline should not lag behind what one has at home. I think that they should be better than at home. There indeed we have a small family, but here, what a family--500 people!

I have been talking, while the vehicle is signaling. You will pardon me, but the billiard tables are a serious matter.

Welder Nikolay Sysketov. I did not think, did not guess that I would be a tester of new machinery. In 15 years I have seen much on the line. I worked on the Soyuz and the Central Asia-Central Economic Region trunk lines, and I welded the Urengoy-Chelyabinsk line--we have had so many stands. But this is a first. This equipment is called the BTS-142-V, and scientists from the Kiev Institute imeni Paton invented it. It is good, I tell you, that it was invented! Previously, on our old stand there were 17 welders, now there are 7. We waited and it came to us--the robot came to the welding stand.

All the same, an eye must be kept on it. And not only mine--a human eye. We shine X-rays through each joint, so that no defective ones will go to the line. Scientifically, it is called radiographic monitoring.

Yes, and right now we have the equipment--not every engineer can make an examination on the move. The 20th century outdoors! We do almost nothing manually that we did that way before....There is our veteran Nikolay Dem'yanovich Kuznetsov, he earned his living with a bench hammer, and he worked on a semiautomatic machine. But now his son Andryusha has passed our production practice, and he is studying in the city of Togliatti to be an engineer. He masters an automatic machine more easily. In general, I tell you, the youngsters are growing up brainy! Andrey is there with the scientists who develop this machinery, and right now they are observing this machinery in action, everyone is explaining something, they read the drawings together, they talk--possibly the stand can be improved still more. We, it is true, also have suggested some things to the Kievites, you take a look and we refine the stand together.

But, in general, it is necessary to study. My son right now is on active service in the army. He writes, "I am being demobilized, and I am coming home, father." He wants to work on the line. Well, I am not against it but will send him to study it, without fail. Today a good welder with a good technical education is priceless. For indeed, our line is not being finished today....

Commissar of the Molodost Student Detachment Nadya Nikitina. Everyone here has work--the line, and we have--the road. It is fine, but is it comprehensible? I will explain: we are building a road to the Zavolzhskaya gas-compressor station. This road is 2 kilometers of concrete topping from the highway to where the compressor construction site is now being developed. And we are 25 students from the construction faculty of Cheboksary State University.

And since I am the commissar of the detachment, I can speak for everyone: it was good luck for us that we happened to come here. On the whole, the choice was great; it was also possible to go either to a Nonchernozem Zone facility or to the Cheboksary GES site. But we chose the gas pipeline. You can understand it yourself--after assignment, one scarcely manages to go at once to such a celebrated construction project. I would like very much that my working biography begins--how shall I put it?--with a ring, on this job! For the gas-export pipeline is now known to the whole world.

And we understand that our contribution is included in it. Be it small, still we have assimilated about 220,000 rubles' worth of those hundreds of millions that the state has released for erection of the route. But this is our work, these 80 days of our life. And be assured that they have not passed in vain. You see the dump truck going with the concrete? It travels rapidly, doesn't it? And it does not pitch on the road....It is our road!

11409

CSO: 1822/110



## PIPELINE CONSTRUCTION

### PROGRESS REPORT GIVEN ON CHIMKENT OIL PIPELINE

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 21 Nov 82 p 1

[Article by Yu. Livinsky (Chimkent): "3. The Southern Branch of the Trunk Line"]

[Text] Of the 1,642 kilometers of the Pavlodar-Chimkent oil pipeline, 703 kilometers are on the Chimkent segment. The collectives of SU-1 [Construction Administration No 1] and SU-2 of Sredazneftegazstroy [Trust for the Construction of Oil and Gas Industry Enterprises in Central Asia] and SU-6 of the Moscow Welding and Assembly Trust, together with their subcontracting organizations, are working here to lay the steel strand.

"On our section, from Barsengir to Chimkent," says the client's representative, deputy chief of the Chimkent Production Control Department of the Transsiberian Oil Trunk Pipeline Administration D. Redkolesov, "there remain, in all, 19 kilometers of overhead welding and 3 kilometers of insulating and pipelaying to be done. All the machinery and manpower will be redeployed from here. Simultaneously, with conclusion of the construction work, hydraulic testing of the pipe is now being conducted, and the working commission is accepting the line's LEP [electric-power transmission line]."

In brief, an important national-economic construction project is in the concluding stage. The builders are hurrying and rushing--the finish line must be crossed quickly, in one breath, in order to beat the deadline called for by the commitment in honor of the 60th anniversary of the USSR.

For 6 long years they have worked for this cherished goal. They worked stubbornly and persistently. They had to work under complicated conditions--a major portion of the segment is in the desert, where temperature gradients are especially felt: in the summer there is unbearable heat, and in winter there are hard freezes. However, the brigades of pipelayers, assemblers, insulators, welders and pipelength-carrier drivers staunchly endured these difficulties and devoted all their efforts to insuring that the steel strand will work without interruption at any time of the year.

The complicated work of SU-2, under the experienced and energetic supervisor E. Khidoyatkhanov, should be specially noted. His headquarters is in Chimkent, hundreds of kilometers from the main sites for basing the shock-work detachments. But he maintains communication with them constantly by radio. And, if necessary, the supervisors flow out to the route and they resolve production questions on the spot. The greatest amount of work on the trunk line fell to the lot of the SU-2

collective. It is laying pipe on the stage between Otasu and Lake Karakoin. This is 251 kilometers on the Karaganda and 174 kilometers on the Chimkent segments. Moreover, in the summer of this year they were entrusted with laying 45 kilometers of pipe in Pavlodarskaya Oblast, to help Bryansktruboprovodstroy [Bryansk Pipeline-Construction Trust] and Lengazspetsstroy [Specialized Trust for the Construction of Gas Industry Facilities in Leningrad] builders. And SU-2 is also building the pump station at Chulak-Kurgan.

The builders of the section under V. Tsarenko deserve special praise. They laid oil pipeline on one of the most difficult segments of the line--from Barsengir to Karakoin. Here all the work, beginning with rotary welding at the base and ending with backfilling of the ditch, were set up for the flow-line group. Thanks to the flow-line method and to the coordinating actions of general contractor and subcontractor brigades of the sections, high indicators for the work were achieved from month to month. In accordance with the results of socialist competition among Glavtruboprovodstroy subunits, it was awarded first place this year. And the brigades of welders of A. Lapchenko, the insulators' and pipelayers' brigade of V. Shishkin, and the assemblers' brigade of A. Golovatskiy and S. Temirgazin are leading here.

Right now V. Tsarenko's section has finished laying the last kilometer of the oil pipeline and is getting ready to meet its southern neighbors--N. Pak's section from SU-1, which is completing work on the Karakoin-Chulak-Kurgan stage. The advanced collectives of two construction administrations of Sredazneftegazstroy are confident of making the "red" joint in the next few days.

The most southerly stage of the steel trunk line, from Chulak-Kurgan to Chimkent, is under the jurisdiction of SU-6, which is led by the well-known gas pipelinelayer Hero of Socialist Labor V. Bevzyuk. Two years ago his collective carried out the basic operations on the route and was transferred north to help build a pipeline there. Having finished laying pipe there, he recently returned to his stage, in order to complete it finally. The builders eliminated in a short time the gap at the Chulak-Kurgan pass and undertook to lay river crossings and to lay pipe on the direct approach route to the Chimkent Oil Refinery.

One of the shock-work facilities of the oil pipeline on the Chimkent segment is the oil pump station at Chulak-Kurgan. Unless it is put into operation, Siberian oil will not go south. The main doers of the work at the facilities due for early startup--the SU-2 builders and their subcontractors--understand this well. Thanks to the shock work of the integrated brigades of V. Utemuratov, V. Kirsanov, V. Amenda and other collectives, box modules were installed, pumps were assembled, and general construction work was completed ahead of schedule. And the startup and setting-up workers from Groznyy and the installers of MU-6 [Installing Administration No 6] of Elektrosredazmontazh [Electrical-Equipment Installation Trust for Central Asia] have now taken the baton from them. The first-named will make a check of the equipment at the pump station, the second will undertake assembly of the substation.

Not much time remains before startup of the Pavlodar-Chimkent oil pipeline. On-time introduction into operation of this important facility will be a major labor victory for the builders and a meaningful gift for the 60th anniversary of the forming of the USSR.

## PIPELINE CONSTRUCTION

### PIPELINE CROSSING OF DNEPR DESCRIBED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 8 Dec 82 p 1

[Article by T. Dem'yanova (Prokhorovka, Cherkasskaya Oblast): "The Crossing of the Dnepr"]

[Text] The signal rocket rises above the cool darkening water. The cable that has been thrown across the river, from the right bank of the Dnepr, tightens, and the steel pipelengths that have just been welded and "fused" together move downwards along the water toward the platform, carefully gripped by the pipelayers' powerful holders. I. Zakharov, chief engineer of the specialized trust Vostokpodvodtruboprovodstroy [Trust for Underwater Pipeline Construction in the Eastern Economic Region], heaved a sigh of relief.

"The inverted siphon has gone."

For Ivan Yakovlevich, the days that preceded start of the crash work had not been easy. Three hundred thousand cubic meters of soil had been taken from the bottom in order to prepare a reliable bed for the gas pipeline. The Kanev sea now and then presented us with a "gift." The suction dredge was choked up with stumps and roots, a submerged log and, even, as was explained later, with mammoth bones. Spring water washed the edges of the ditches and had to be cleared away all the time. Preparation also included many other urgent matters. Together with chief diving specialist G. Sanayev, they sat for a long time making calculations, cutting down on the already rather demanding deadlines. This was done only by constantly "inventing" new solutions. They found them. The small office on the sandy shore of the Dnepr, beside the construction and installing site, was transformed into a genuine headquarters for combat operations.

The inverted siphon has gone! The conspicuous red cap on the 250-meter pipe was already in the depths. Standing watch at the winch is senior diver G. Andreyev. Pipelayer operators V. Sirotyuk, V. Babichenko and V. Dudarev were linked together as if by a single thread. The tenseness should not be telling on the rhythm. By day, the pipelength is pulled ahead, and at night the next section is welded to it and insulated. And so, the head of the pipe still has not reached the right bank. Four pipelengths must be pulled through. Everything is scheduled by the hour, everything stems from the commitments. By the time the inverted siphon intersects the Dnepr, the Leningrad and Bryansk pipeline workers weld the unifying joints on the two shores, and the red flags of the route advance westward on the country's maps. Russians, Ukrainians, Georgians, Tatars and Bashkirs--workers of almost all our motherland's nationalities--labor with inspiration to build the gas arterial, to provide a shock-work pace. Half a year has been saved. And this reserve is a kilometer per day, when the speed of movement is considered.

## PIPELINE CONSTRUCTION

SELECTED SYNOPSSES OF ARTICLES IN 'PIPELINE CONSTRUCTION', OCTOBER 1982

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 10, 1982 p 48

UDC 621.643/553.002.2+001.7

### ACCORDING TO THE LEVEL OF DEVELOPMENT OF SOCIALISM

[Synopsis of article by A. P. Vesel'yev, from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982, pp 2-4]

[Text] It is shown that the engineering policy of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] corresponds strictly to the basic principles of the USSR Constitution, which was adopted 5 years ago--7 November 1977. The basic achievements of the ministry's organizations in recent years are examined, and the main directions of its subunits' activity are reflected. Steps taken within the industry to solve social tasks--improvement of all aspects of the vital activity and more complete satisfaction of the workers' material and inner needs--are cited.

UDC 553.002.2(571.1)+62.001.7

### DEVELOPMENT OF GAS RESOURCES IN WEST SIBERIA AND PROBLEMS OF RAISING THE TECHNICAL LEVEL OF GAS-FIELD STRUCTURES

[Synopsis of article by R. D. Margulov, from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 5-7]

[Text] It is shown that the most important task in the modern era is the joining of the forces of all scientists, designers, design-developers and production workers who are engaged in conquest of the North for comprehensive generalization of the experience gained and for the creation of unified methodological and standards supervision on questions of developing the region. Advanced methods for building up the fields' facilities are described. Measures that help to increase the efficiency of construction work are examined.

## ENGINEERING SOLUTIONS FOR GAS-FIELD STRUCTURES OF THE MEDVEZHYE FIELD AND WAYS FOR INCREASING THE RELIABILITY OF THEIR OPERATION

[Synopsis of article by N. G. Portyanko from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 7-8]

[Text] Measures that will help to raise the operating reliability of gas-field structures are described. Methods for laying gas-gathering grids and devising footings are examined. Measures that will enable operating efficiency at the fields to be raised are planned.

UDC 621.311.2.002.2

## INCREASE THE EFFECTIVENESS OF ELECTRICAL INSTALLING WORK

[Synopsis of article by B. M. Borisevich and V. I. Rylenko, from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 13-14]

[Text] Work performed by Surgutneftegaz elektromontazh [Surgut Trust for the Installation of Electrical Equipment at Oil and Gas Fields] at the industry's facilities that are being built in Tyumenskaya and Tomskaya Oblasts are described. The prospects for integrated-module installation of electrical equipment are indicated. New engineering and organizational solutions are cited, and instruments, mechanisms and equipment that will enable labor productivity to be increased, installing processes to be facilitated and the construction season to be extended are described.

UDC 621.543.002.2/551.481.2

## INTERAGENCY TEST OF ANCHORING DEVICES ON THE URENGOY-NOVOPSKOV ROUTE

[Synopsis of article by V. V. Bessarab, V. Ya. Chukmaldin and I. V. Sigalov, from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 14-15]

[Text] The specifications of anchors that have been tested for strength are given. The conditions of the tests and their results are described. The efficiency of the AR-401 and AR-405 anchoring devices has been proved. One table.

UDC 621.643.002.2+331.875.3

## MECHANIZATION OF PIPELINE CONSTRUCTION IN SWAMPY LANDS AND FROZEN SOILS

[Synopsis of article by O. A. Stepanovskiy from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 16-17]

[Text] New technical equipment that enables labor intensiveness to be reduced considerably on the routes of pipelines that are being built in swampy lands and frozen soils are described. It is noted that an effective measure for facilitating the operation of equipment in swamps is the introduction of progressive technology that precludes high loads on a soil foundation. The urgency of the problem of creating special equipment for erecting both trunk pipelines and intrafield pipelines is shown.



## LARGE-VOLUME BOX MODULES AND TRANSPORT THEREOF

[Synopsis of article by V. A. Aronov, V. G. Andriyenko, G. V. Zinov'yev and others, from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 20-23]

[Text] The effectiveness of creating large-volume modules for given functional purposes that are fully prepared at the factory is shown. Reserves for raising the pace of construction of oil and gas field facilities that are made from large-volume modules of large unit weight are examined. Methods for transporting such modules are described. Five illustrations.

UDC 624.009.073-412+621.316.1

## INTEGRATED-MODULE METHOD FOR BUILDING ENGINEERING-SUPPORT FACILITIES

[Synopsis of article by M. S. Royter, from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 23-24]

[Text] It is shown that the duration of operations during the below-grade cycle can be reduced by using the integrated-module method where the on-the-ground part of the engineering-support facilities is produced at the bases. The principles that call for programs for introducing the integrated-module method for erecting all engineering-support facilities, which were worked out by Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] and Gosgrazhdanstroy [State Committee for Nonindustrial Construction and Architecture], are described. Two illustrations.

UDC 621.643.002.2+502.36

## PROTECTION OF THE ENVIRONMENT DURING PIPELINE CONSTRUCTION IN FROZEN SOILS

[Synopsis of article by V. P. Koval'kov, from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 28-29]

[Text] The desirability of formulating special construction methods that will support the vital activity of the population in regions that are being developed is shown. Operating regimes for trunk pipelines that are being laid in frozen soil that will protect the environment in the country's northern regions are identified.

UDC 621.643.001.3

## RESISTIVITY OF CLAD PIPE TO BENDING

[Synopsis of article by P. A. Vislobitskiy, A. G. Voynitskiy, I. I. Pichurin and others, from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 30-31]

[Text] The results of research of the resistance of clad pipe to bending are cited. The operation of two-layer models and lengths made of spiral-seam tube is examined. It is shown that the structure of spiral-seam pipe retains its efficiency during bending until the stresses in the load-bearing elements reach maximum values. One illustration and two tables.

## ERECTION OF AN UNDERWATER CROSSING 1,420 MM IN DIAMETER

[Synopsis of article by A. Ye. Kalmykov, B. N. Krupkin and V. G. Pilipenko, from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 36-37]

[Text] The erection of an underwater crossing on the Urengoy-Novopskov route, using UTK-type reinforced-concrete weights, is described. The design of the weights is examined, and the overall scheme for construction and the procedure for effecting the technological recommendations are cited. The indicated technology has been recommended for wide use. Three illustrations.

UDC 621.643.001.5

## THE DEFORMATION-STRESS STATE OF AN OIL PIPELINE

[Synopsis of article by O. N. Vinkler, A. G. Krayev, V. V. Zhitenev and others, from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 32-33]

[Text] The results of a study of a spectrum of the loaded state of an oil pipeline during a normal operating regime and when simulating an emergency stoppage of an oil-pump station are cited. It was established that the degree of effect of such a spectrum of loads on strength of the pipeline can be evaluated to take into account the number of cycles of changeover of pump units and the existence of defects in the basic metal and in the welded joints. Two illustration.

UDC 621.634.002.2/658.5.001.24

## A DYNAMIC MODEL OF A CONSTRUCTION FLOW-LINE GROUP

[Synopsis of article by N. I. Gromov, from STROITEL'STVO TRUBOPROVODOV [Pipeline Construction], No 10, 1982 pp 34-35]

[Text] It is shown that flow-line erection of a pipeline is a multidimensional random process that consists of a finite set of processes, the development of which is determined by the principles of the flow-line method for organizing the work. A model of automated design of an organization for pipeline construction can be developed on the basis of the dynamic model that has been created. The bibliography has 4 titles.

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## PIPELINE CONSTRUCTION

### BRIEFS

**SHCHEKINO PIPELINE SEGMENT**--Shchekino (Tul'skaya Oblast), 8 Dec--The Shchekinogazstroy [Shchekino Trust for the Construction of Gas-Industry Enterprises] has received a report from the route of the Urengoy-Uzhgorod gas trunk pipeline, which is under construction, about completion of the basic linear operations on the segment that workers and specialists of this trust have been erecting. The Shchekino segment, 53 kilometers long, has its start on the right bank of the Don, in Lipetskaya Oblast, and it stretches across fields, ravines, streams and copses in the direction of Yelets. A difficult campaign, which relied upon skillful engineering support, has continued here for about half a year. "The collective of the integrated flow-line operations group is under the experienced and energetic supervisor M. Zhigilev, says trust manager O. Sagitov. "The large-diameter pipe was welded on special racks into 34-meter sections by means of high-powered equipment. Then the steel pipe-lengths were sent out on a route that had been cleared in advance and were joined by electric welding into a continuous strand, which, after completion of the insulation work, was buried in a deep ditch. Thanks to precise organization of the job, an enormous amount of linear work was done more than half a year ahead of schedule. Right now, thorough preparation is going on for testing of the trunk line that has been laid, using Don water." In the first quarter of next year it is planned to send natural gas along it, ahead of schedule, and to present it to the acceptance commission. Builders of M. Zhigilev's integrated operating column were solidly based on the Don steppe and erected a well-appointed settlement. The advanced collective has been charged with erecting, along with the first 53-kilometer gas line, a second one. [Stringer N. Makharinets] [Text] [Moscow PRAVDA in Russian 9 Dec 82 p 1] 11409

**TRANSCAUCASIAN GAS PIPELINE**--The Mozdok-Kazi-Magomed gas pipeline was accepted for operation yesterday. This steel thread, which is about 700 kilometers long, has become part of the unified Urengoy-Novopskov-Aksay-Mozdok gas pipeline system, over which the natural fuel will come to Transcaucasia. "The new gas pipeline," Transgaz [Azerbaijan Gas-Transport Association] deputy director S. Bagirov told the Azerinform correspondent, "will enable the economies of the Transcaucasian republics, which are being developed intensively, to satisfy their requirements for inexpensive fuel. Each day more than 10 million cubic meters of West Siberian gas will be sent to Georgian and Armenian industrial and agricultural enterprises from Azerbaijan." [AzerINFORM] [Text] [Baku VYSHKA in Russian 22 Oct 82 p 1] 11409

**COMPRESSOR STATION BUILDERS' NEEDS**--In one of the sets of related articles about gas pipeline construction progress, we criticized the supervision of Glavvostokenergostroy [Main Administration for the Construction of Power-Engineering Enterprises

in the Eastern Economic Region] of USSR Minenergo [Ministry of Power and Electrification] for deficiencies in organizing everyday-living affairs for the workers who are building the Krasnoturinsk Gas Compressor Station. As Glavvostokenergostroy chief V. Kondrat'yev has reported to the editorial board, the deficiencies noted by the board have now been eliminated. The workers have been placed in comfortable housing, and two dining halls and a foodstuffs store are operating directly at the construction site. The automotive transport schedule has been revised to take the workers' desires into account. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 26 Nov 82 p 2] 11409

PETROPAVLOVSK-KOKCHETAV PRODUCT PIPELINE--Kokchetav, 21 Nov--The first kilometers of pipe on the Petropavlovsk-Kokchetav petroleum-product pipeline have been laid. The 180-kilometer long branch will be turned over for operation next year. Then it will be extended to Tselinograd. The Kazakhstan branch from the Ufa-Novosibirsk petroleum-product trunk pipeline will supply completely the requirements of the republic's northern oblasts for gasoline and other petroleum product. [Stringer N. Obukhov] [Text] [Moscow PRAVDA in Russian 22 Nov 82 p 1] 11409

MINSK-GOMEL GAS PIPELINE--The Minsk-Gomel gas pipeline will improve the supply of valuable raw materials and fuel for southwestern Belorussia. Testing of a kilometer-long sag bend on the route has commenced. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 48, Nov 82 p 5] 11409

PETROZAVODSK BALL-VALVE OUTPUT--The collective of the Petrozavodskmash Association imeni V. I. Lenin has mastered ahead of the schedule the output of ball-cock gas valves. The first lot of this output has been shipped to the Urengoy-Pomary Uzhgorod pipeline route. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Oct 82 p 3] 11409

TYUMEN-EUROPEAN USSR PIPELINE--The first joint in the construction of the terminal section of the oil trunk line from the northern regions of Tyumenskaya Oblast to the European part of the country has been welded. The line will be almost 2½ thousand kilometers long. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Oct 82 p 3] 11409

BAKU PIPE-CARRIER, PIPELAYER OUTPUT--Baku--Machinebuilders of the Bakinskiy rabochiy Plant sent out 15 pipelength carriers a couple of days ago to the builders of the West Siberia-Western Europe gas pipeline. The load capability of each of the 250 vehicles produced since the start of the year is 19 tons. The plant's collective is undertaking the output of 25-ton automotive pipelength carriers. The production of self-propelled pipelayers capable of laying a 12-ton length of steel pipe in the ditch in one grab has been mastered by the machinebuilders of the Plant imeni B. Sardarov. The first above-plan lot of these units has been sent to Tyumenskaya Oblast. And a train loaded with 25-ton self-propelled cranes for installing heavy equipment also has gone to West Siberia. [V. Sinipyn] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 16 Nov 82 p 4] 11409

TURKMEN RURAL GAS PIPELINES--Natural gas has come these days to much of the housing of kolkhoz workers of Mariy, Bayram-Ali and Vekil-Bazar rayons. Workers of SMU-4 [Construction and Installing Administration No 4] of Turkmen SSR Goskomgaz [State Committee for Gas Supply] have laid 35 kilometers of gas pipelines to the farms of these regions. [V. Mamedov] [Text] [Ashkhabad TURKMENSKAYA ISKRA in Russian 15 Dec 82 p 4] 11409

TATAR PIPELINE WORKERS' NEEDS--Kazan--Our ors [workers supply section] serves the Urengoy-Uzhgorod gas-pipeline segment that is passing through Permskaya and Kirovskaya oblasts and the Udmurtskaya, Mariyskaya and Tatarskaya autonomous republics. More than 100 dining halls that are in operation at the shock-work construction project--well-supplied mobile units--are deployed in the so-called field settlements, where the builders and their families are living in standard cottages with all the conveniences. At remote points of the route we have sent meals in thermos containers. More than 2,000 people are now employed daily in supplying workers with social dining. Moreover, we are selling the settlements' residents semifinished goods, and we are organizing exhibits and sales of culinary articles. In brief, all those services that social-dining enterprises extend to city residents are being granted to the builders, under pipeline-route conditions. The workers of social dining understand that it is a great honor to work on the line. By the start of October they had fulfilled the plan for the first 10 months of the year, and, additionally, had produced and sold 200,000 rubles' worth of their own output. [K. Leont'yev, chief of the ors of Tatnefteprovodstroy [Tatar Oil-Pipeline Construction Trust]] [Text] [Moscow SOVETSKAYA TORGOVLYA in Russian 7 Nov 82 p 1] 11409

UFA PIPELINE BUILDERS REDEPLOYED--Ufa--The pipeline-route workers of two Ufa trusts--Vostoknefteprovodstroy [Trust for Oil Pipeline Construction in the Eastern Economic Region] and Nefteprovodmontazh [Trust for Oil Pipeline Installation Work]--have been redeployed to Udmurtia and Permskaya Oblast, where they have begun to lay the linear portion of the Urengoy-Uzhgorod gas pipeline. The Ufa trusts have organized integrated flow-line operations groups, which work under a single job order. The equipment operators of Bashkiria, following the example of advanced USSR Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] collectives, are bringing output up to the level of the best indicators in the industry--they are laying a kilometer of finished pipeline per day. [R. Fay-zrakhmanov] [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 14 Oct 82 p 1] 11409

PIPELINE AIR-COOLER OUTPUT--Moscow--Motors for air-cooling apparatus for the Urengoy-Pomary-Uzhgorod gas pipeline were designed for work in the north. The collective of the Electrical Machinery Plant imeni Vladimir Il'ich sent clients the first lot of such units today. Thorough engineering preparation and the workers' high vocational level helped to insure output of the new equipment in a short time. [Text] [Vilnius SOVETSKAYA LITVA in Russian 2 Oct 82 p 1] 11409

URALS PIPELINE CONSTRUCTION--Berezovka--Novosibirsktrudoprovodstroy [Novosibirsk Pipeline-Construction Trust] builders have traveled half of the way to the Permian segment of the Urengoy-Pomary-Uzhgorod line. "We had to build 92 kilometers of gas pipeline from the Chusovaya River to the Sylva River," said section chief A. Maylikhanov. "Forty-six kilometers of the arterial have already been laid in the ground." In the summer the builders made record progress--up to 1½ kilometers per day, but right now the pace has been reduced. During the first half of November about 12 kilometers were made. But these were the most difficult kilometers. A winter of no kind has come to the Urals. The roads that were packed down during the summer have become almost impassable. But the roar of motors in the forested cuttings do not quiet down, either by day or by night. The builders are waiting for very cold weather. When it comes, the work pace will increase. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Nov 82 p 1] 11409

CROSSING OF DNEPR BEGINS--Cherkasskaya Oblast--Yesterday the laying of an inverted siphon for the Urengoy-Uzhgorod gas pipeline over one of Europe's largest river--the Dnepr--began in the vicinity of Prokhorovka village in Cherkasskaya Oblast.



Beginning to lay the siphon across the Dnepr these days means that the builders have carried out 7 months ahead of time the socialist commitments they adopted in honor of the 60th anniversary of the forming of the USSR. [Text] [Moscow TRUD in Russian 26 Nov 82 p 1] 11409

CHUVASH PIPELINE BUILDING PROGRESS--Cheboksary--Builders of the Chuvash segment of the Urengoy-Pomary-Uzhgorod gas pipeline have completed the crossing of the Bolshoy Tsivil River ahead of time. The work was speeded up by skillful manipulation of the equipment through the coordinated actions of interdependent entities. The collective of Kuybyshevtruboprovodstroy [Kuybyshev Pipeline-Construction Trust], which is installing the arterial in Chuvashia, plans to weld the concluding joint on the segment ahead of schedule--by 18 December, the day of the Communist free-work Saturday. [Text] [Moscow TRUD in Russian 4 Dec 82 p 1] 11409

ENTRAINED DELIVERY OF SOLIDS--Leningrad--Polyethylene containers with hard asphalt have been delivered by an extraordinary path from Kirishi, near Leningrad, to the Krasnyy Bor terminal station. Entrained in a stream of petroleum product being pumped, they traveled a 115-kilometer pipeline at a speed of more than 4 kilometers per hour. This was just an experiment, but specialists of the Leningrad Administration of Petroleum-Product Trunk Pipelines of USSR Goskomnefteprodukt [State Committee for the Supply of Petroleum Product] consider that, in principle, the new method has a great future. The assembly of an experimental-test installation for launching the containers at the Kirish station has been completed, and a receiving station is being readied at Krasnyy Bor. [I. Selivanov] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 26 Oct 82 p 1] 11409

UKRAINIAN PIPELINE CONSTRUCTION--Chemerovtsy, Khmel'nitskaya Oblast--The flow-line method of joining pipe into lengths has been used at the segment of the Urengoy-Pomary-Uzhgorod arterial that is being laid in Khmel'nitskaya and Ternopolskaya Oblasts. The welders' labor productivity has been increased 1½-fold. The innovation was introduced under the supervision of the young superintendent, I. N. Boychuk. This method, which is a product of the Ivano-Frankovsk Institute for Oil and Gas, was mastered during erection of the Soyuz gas pipeline. Already on the first day of work under the new system, the welders turned out not 10 but 15 joints during a shift. A high professional level and skill in working with people distinguish the young engineer. The new supervisor has been well received in the section. The welders at once assessed his thorough knowledge of the subtleties of their specialty--it was at the initiative of I. N. Boychuk that gas-protected electrodes were used. They raised appreciably the pace and quality of the work and improved working conditions. [S. Shumakher] [Text] [Kiev PRAVDA UKRAINY in Russian 10 Nov 82 p 3] 11409

KAZAKH PIPELINE BUILDING--Petropavlovsk (Kazakh SSR), 29 Dec--The collective of builders of the local SMU-4 [Construction and Installing Administration] of Ural-neftegazstroy [Trust for the Construction of Oil and Gas Industry Enterprises in the Urals Economic Region] completed the task for the anniversary year ahead of time. The administration's advanced brigades have to their account hundreds of kilometers of pipe laid on the gas and oil trunk lines of our country's north. And now they have completed erection of the 170-kilometer Kaspiy-Orsk oil pipeline. The main application of the builders' forces was the laying of the gas trunk lines that had their start at the Urengoy field. [Stringer V. Varov] [Text] [Moscow PRAVDA in Russian 30 Dec 82 p 1] 11409

'STYK' PIPELINE WELDING COMPLEXES--A hundred kilometers of large-diameter pipe have been welded on the Kursk segment of the Urengoy-Pomary-Uzhgorod gas pipeline. Almost half of all the joints that unite the pipelengths into a continuous thread at the place where it was laid into the ditch were made by Styk-1 welding complexes. Ministry of Electrical-Equipment Industry enterprises shipped this equipment. The welders' brigade of V. Leont'yev from Krasnodartruboprovodstroy [Krasnodar Pipeline-Construction Trust] was one of the first on the route to master the new equipment. Use of the complex speeded up doubly the making of each joint. "It is always difficult to master new equipment, yet our welders proved themselves to the hilt," says V. Leont'yev. The results were impressive: Leont'yev's brigade welded a thousand joints. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 17 Oct 82 p 2] 11409

PERM-ALMETYEVSK LINE COMPLETED--Kazan--The 450-kilometer Perm-Almetyevsk oil pipeline has been turned over for operation, enabling the amount of pumping of crude over the Druzhba arterial to be greatly increased. Thus, one of the items of the commitments of Tatnefteprovodstroy [Tatar Pipeline Construction Trust] in honor of the 60th anniversary of the USSR was fulfilled ahead of time. The most complicated segment of the route proved to be the one laid in Tataria: 3 rivers, 8 highways and many existing oil pipelines were encountered on this 160-kilometer segment of the route. Nevertheless, the task was carried out ahead of time. [Stringer Yu. Alayev] [Text] [Moscow IZVESTIYA in Russian 19 Dec 82 p 1] 11409

PIPELINE INTERSECTS BUSY HIGHWAY--Tambov--Laying of the pipe of the Urengoy-Pomary-Uzhgorod gas pipeline under the busy Moscow-Volgograd highway has been completed well ahead of time. This segment passes alongside Pervomayskiy settlement. The task was not simple, even for G. Popov's experienced brigade. The soil proved to be very weak to a depth of several meters, and it floated, which greatly complicated the work. Now the way for the gas route has been opened. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 10 Dec 82 p 1] 11409

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